

ARTHROPOD FAUNA OF THE UAE

VOLUME 3



PATRON:

H.H. SHEIKH TAHNOON BIN ZAYED AL NAHYAN

EDITOR:

ANTONIUS VAN HARTEN





**ARTHROPOD FAUNA
OF THE
UNITED ARAB EMIRATES**

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NAHYAN**

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The chapters have been arranged in a phylogenetic order, according to H.H. Dathe (ed.), Lehrbuch der Speziellen Zoologie, Band 1 : Wirbellose Tiere, 5. Teil : Insecta, Spektrum Akademischer Verlag, Heidelberg – Berlin, 961 pp. Korrigierter Nachdruck 2005.



PREFACE

Many countries around the world have shown that rapid development does not necessarily mean a breakdown of the environment. In recent years, several protected areas, where biodiversity, plant as well as animal, can thrive free from outside influences, have been established throughout our country.

The cataloguing of the terrestrial and fresh-water arthropods of the UAE has yielded numerous species not before recorded in the country and, even, scores of species new to science. Internationally, the project has received impressive attention from biodiversity workers. Through the publication of this book series, scientists from all over the world have come to the realisation that the United Arab Emirates does not consist merely large desert plains but also stony deserts, lofty mountain valleys, rocky hills, permanent streams, coastal salt marshes, mangroves, wadis and other geographical features. This has resulted in many specialists seeking to visit the UAE to study species of interest to them in their natural habitat. Nationally, the project has became better known to the public through coverage by the press and television.

This Volume 3 of Arthropod Fauna of the UAE documents further additions to the fauna. Several families of insects are dealt with for the first time; of particular interest are two families of spiders. As always, the book is meticulously illustrated with photographs, aquarelles and line drawings; which richness has become the benchmark of the series. The editor and the many scientists that have collaborated to produce this volume are to be congratulated.

I strongly urge scientists in the country to follow up and conduct research into the life history of the arthropod species recorded in the three volumes published so far.

Abu Dhabi, February 2, 2010

H.H. Sheikh Tahnoon Bin Zayed Al Nahyan



H.H. Sheikh Khalifa Bin Zayed Al Nahyan

President of the United Arab Emirates



H.H. Sheikh Mohammad Bin Zayed Al Nahyan

Abu Dhabi Crown Prince and Deputy Supreme Commander of the U.A.E. Armed Forces

INTRODUCTION

Volume 2 of 'Arthropod fauna of the UAE' was published in March 2009 and Volume 3 is following one year later. Chapters have been elaborated by 51 specialists from 20 countries. Of the 52 families dealt with in the third volume, 24 had not before been recorded from the UAE. One new genus and 71 new species new to science are described. In total some 400 species are added to those already known in the UAE.

During 2009 the project received coverage in the national press, in Abu Dhabi as well as in Dubai. A feature about the project was shown in October on Abu Dhabi Al Emarat Television. Some further collecting was carried out by the staff, mainly with the help of water traps and pitfall traps. During 2009, six specialists came to Sharjah to collect material of their own groups, viz. Dr. Andrew Polaszek, Natural History Museum, London, UK (Plate 1), Dr. Mathias Jaschhof and his wife Catrin of the Senckenberg German Entomological Institute, Müncheberg, Germany (Plates 2 and 3), Dr. Christian Schmid-Egger of Berlin, Germany (Plate 4), Dr. Erwin Scheuchl of Velden, Germany (Plate 4) and Dr. Alexandr Gromov of the University of Almaty, Kazakhstan (Plate 5). A considerable number of species they collected are already dealt with in Volume 3, the remainder will be treated in future volumes. Coordinates of all collecting localities are given at the end of this volume.

I am very grateful to H. H. Sheikh Tahnoon Bin Zayed Al Nahyan for his continuous sponsoring of the project. His generous contribution will long be remembered by all workers involved in the biodiversity of the Middle East.

Special thanks are again due to John Deeming, National Museum of Wales, Cardiff, UK, for sorting many fly samples into families and for correcting the English of this volume. Without the help of Andreas Stark, Halle, Germany, the illustrations of this volume would surely not have the same quality. Erik van Nieukerken, National Natural History Museum, Leiden, Netherlands, assisted with the coordination of the chapters about moths (Lepidoptera). Four colleagues made available photographs for chapters written by other persons: Cees Gielis (Lexmond, Netherlands), Martin Hauser (Sacramento, USA), Jan Batelka (Prag, Czech Republic), Andreas Stark (Halle, Germany), Mathias and Catrin Jaschhof (Müncheberg, Germany) and Christian Schmid-Egger (Berlin, Germany).

Vladimir Kononenko, Vladivostok, Russia, very competently processed many photographs of Lepidoptera and Hymenoptera. James Turner, Cardiff, UK, made several brilliant photographs of flies and plant hoppers. Stefan Blank again was of help when the editor made a series of photographs of beetles at the photo-microscope of the Senckenberg German Entomological Institute, Müncheberg, Germany. Within the UAE, the continuous assistance by Christel Griffioen (Sharjah Desert Park) and Christophe Tourenq (WWF, Fujairah) must be acknowledged. Vladimir Korshunov (Endangered Wildlife Breeding & Conservation Centre, al-Ain) has been of great help assisting with collecting activities in the al-Ain area. Khalid Mahmood operated the trapping network and accompanied the visiting specialists.

Mr. Saje Thomas, Managing Director of the Royal Group, Abu Dhabi, as always took a personal concern with the project and was available whenever a problem occurred. His



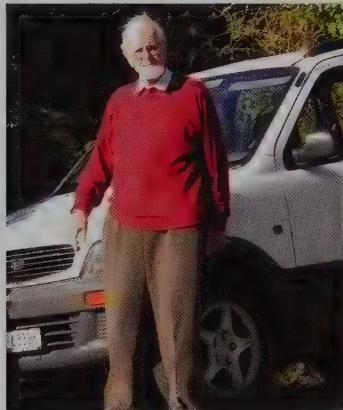
Plates 1-2. 1: Andrew Polaszek; 2: Mathias Jaschhof. (Photographs by M. & C. Jaschhof)



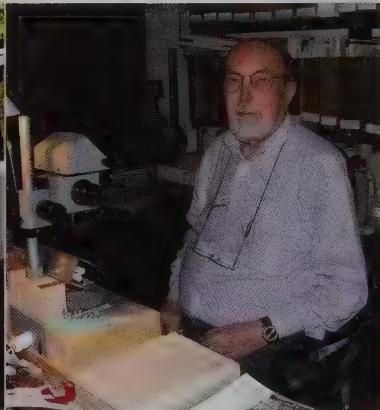
Plates 3-5. 3: Catrin Jaschhof; 4: Erwin Scheuchl (left) and Christian Schmid-Egger; 5: Alexandre Gromov. (Photographs by M. Jaschhof, A. van Harten & K. Mahmood, resp.)

Secretary, Mrs. Sunita Gomes, and Accountant, Mrs. Prarthana Devaiah, took great pains with the administrative and financial aspects of the project.

The competent printing of the volumes by Dar Al Ummah Printing Publishing & Distribution, Abu Dhabi, should not be taken for granted. The staff, especially the General Manager Mr. Benchamin K. Roy, the Head of Costumer Service & Prepress Mr. Veera Kalbandi, and the Art Director Mr. Muhammed Arif Salam, went out of their way to make the volumes as attractive as possible.



Prof. Dr. Wilhelm Büttiker



Dr. Luigi Magnano

In June 2009, Prof. Wilhelm ('Willi') Büttiker of Magden, Switzerland, passed away. Prof. Büttiker worked in Saudi Arabia from 1975 to 1985, where he started the 'Zoological Survey of Arabia'. Together with Dr. Walter Wittmer he founded in 1979 the journal 'Fauna of Saudi Arabia' (now 'Fauna of Arabia'), of which so far 24 volumes have been published. Prof. Büttiker is considered the father of Arabian biodiversity studies.

In July 2009, Dr. Luigi Magnano of Poggibonsi, Italy, passed away. He was a specialist of weevils, particularly those of the genus *Otiorhynchus*. In his 83 published papers he described more than 100 *Otiorhynchus* species, and over 20 closely related genera, besides other weevils. Dr. Magnano was the senior author of the chapter on Curculionoidea that was published in volume 2 of 'Arthropod fauna of the UAE' (pages 216-266).

I dedicate this volume to the memory of Prof. Büttiker and Dr. Magnano.

Sharjah

The editor

Order Araneae, family Linyphiidae

Andrei V. Tanasevitch

INTRODUCTION

The Arabian Peninsula is the largest in Asia, yet this huge area remains a real ‘terra incognita’ as regards the linyphiid spider fauna. Only one linyphiid species, i.e. *Prinerigone vagans arabica* (Jocqué, 1981), described from Wadi Khumra, ar-Riyād, Saudi Arabia (Jocqué, 1981), is known from this territory. Even though a rich dwarf-spider fauna can hardly be expected to be supported by such an arid territory like Saudi Arabia, the diversity must certainly be higher. To prove this, this contribution deals with a total of seven species from five genera.

Linyphiid spiders have been collected in the United Arab Emirates using various sampling techniques during five years. Of the seven species revealed, three are new to science while the remaining four, all widespread, are here reported from the UAE for the first time.

MATERIALS AND METHODS

This paper deals with a collection of linyphiids made during 2005–2009 in different localities of the United Arab Emirates. The following collecting methods were used: Sifting of leaf litter; light, water, pitfall and Malaise traps; sweep-net and hand-collecting. If not otherwise stated, the specimens were collected by A. van Harten.

All holotypes are deposited in the collection of the Muséum d’histoire naturelle de Genève (MHNG), Switzerland. Paratypes and other specimens are divided between the MHNG, the United Arab Emirates Invertebrate Collection (UAEIC), the Zoological Museum of the Moscow State University, Moscow, Russia (ZMMU), and the Musée Royal de l’Afrique Centrale in Tervuren, Belgium (MRAC).

The chaetotaxy of Erigoninae is given in a formula (e.g., 2.2.1.1) which refers to the number of dorsal spines on tibiae I–IV. In Micronetinae, the chaetotaxy is given in a different formula, e.g., Ti I: 2-1-1-2(1), which means that tibia I has two dorsal, one pro-, one retrolateral spine, and two or one ventral spine (the apical spines are disregarded). The sequence of leg segment measurements is as follows: Femur + patella + tibia + metatarsus + tarsus. All measurements are given in mm. Scale lines in the figures are 0.1 mm unless otherwise indicated.

The terminology of the genitalic structures in Micronetinae follows that of Saaristo & Tanasevitch (1996). The terminology of the palpal structures in Erigoninae follows that of Hormiga (2000).

Abbreviations used in the text and figures: ARP - anterior radical process, DP - dorsal plate, DPS - distal part of scape, DSA - distal suprategular apophysis, E - embolus, ED - embolic division, EG - entrance groove, EP - embolus proper, Fe - femur, L - lamella characteristica, LT - light trap, MPS - middle part of scape, Mt - metatarsus, MT - Malaise trap, P - proscape, PA - patellar apophysis, PMP - posterior median plate, PT - pitfall trap; R - radix, TA - terminal apophysis, Th - thumb, Ti - tibia, WT - water trap.

SYSTEMATIC ACCOUNT

Subfamily **Erigoninae** Emerton, 1882

Genus *Erigone* Audouin, 1826

Type species: *Linyphia longipalpis* Sundevall, 1830.

Erigone autumnalis Emerton, 1882

Figures 1–11

Specimens examined: Al-Ajban, 1♂, 26.ii–2.iv.2006, MT; 1♀, 10.iii.2007, leaf litter, margin of grass field. Sharjah, 4♂, 8♀, in leaf litter from garden, 12.iii.2007.

Description: Male. Total length 1.40. Carapace 0.63 long, 0.45 wide, unmodified (Fig. 7), lateral edge toothless, pale brown to yellow. Chelicerae as in Figure 8, 0.28 long. Legs yellow. Leg I 1.77 long (0.48+0.13+0.53+0.33+0.30), IV 1.63 long (0.45+0.15+0.45+0.33+0.25). Chaetotaxy: 2.2.1.1; spines about as long as diameter of tibia. TmI - 0.42. Metatarsi IV without trichobothrium. Palpal tibia with only one ventral wart near base. Palp (Figs 1–6): Patella a bit shorter than tibia. Patellar apophysis almost as long as patella. Tibia pointed apically. Distal suprategular apophysis relatively long, wide and rounded. Embolic division with a long, sharp, basally serrated process directed forward. Abdomen 0.60 long, 0.53 wide, grey to dark grey.

Female. Total length, 1.28. Carapace 0.60 long, 0.40 wide, unmodified. Chelicerae 0.28 long, unmodified. Leg I 1.48 long (0.40+0.15+0.40+0.28+0.25), IV 1.53 long (0.45+0.15+0.40+0.30+0.23). TmI - 0.43. Abdomen 0.58 long, 0.50 wide. Epigyne and vulvae as in Figures 9–11. Body and leg colouration, as well as chaetotaxy as in male.

Remarks: This species can easily be recognized by the very small size, by the unusual chaetotaxy pattern (2.2.1.1 as compared with 2.2.2.1), the unarmed edge around an unmodified male carapace, the absence of an anterolateral row of teeth on the chelicerae in both sexes, as well as by the peculiar shape of the embolic division and vulvae.

Distribution: *E. autumnalis* is widespread in the Nearctic and in the northern part of the Neotropics; introduced (?) to Europe: Switzerland (Pantini & Isaia, 2008), Italy (Isaia et al., 2007), Azores (Borges & Wunderlich, 2008), and now found in the UAE. A dead male of this species was trapped in aerial nets at Marble Point, Antarctica (Forster, 1971).

Erigone prominens Bösenberg & Strand, 1906

Specimens examined: Fujairah, 3♀, 28.ii–1.iv.2006, LT. Ghalilah, 1♂, 8.iii.2005, hand-collecting. Near al-Hayer, 1♂, 1♀, 2.iii.2005, hand-collecting. Khor al-Khwair, 1♀, 22.ii–1.iii.2007, LT; 1♂, 1♀, 1–8.iii.2007, LT; 3♀, 8–14.iii.2007, LT; 1♀, 15–22.iii.2007, LT. Sharjah, 1♂, 2♀, 2 juv., 12.iii.2007, in leaf litter from garden. Sharjah Desert Park, 3♂, 1♀, 25.ii–25.iii.2006, LT. Wadi Bih dam, 3♂, 3♀, 22.ii–1.iii.2007, LT; 3♂, 3♀, 15–22.iii.2007, LT; 1♂, 22–26.iii.2009, WT. Wadi Shawkah, 1♀, 1–7.iv.2007, WT; 1♂, 1♀, 30.i–18.ii.2008, WT.

Remarks: This species shows great variability in the somatic and genitalic characters well illustrated by numerous authors (see Platnick, 2009).

Distribution: St. Helena Island, Afrotropical realm, including Madagascar and Comoro Islands (Scharff, 1990), Korea (Paik & Namkung, 1979), China, Tibet, Taiwan (Song & Li, 2008), Vietnam (Tu & Li, 2004), Nepal (Wunderlich, 1983, as *E. cf. ourania* Crosby & Bishop, 1928), introduced to New Zealand (Millidge, 1988), Micronesia & Polynesia (Beatty et al., 1991).

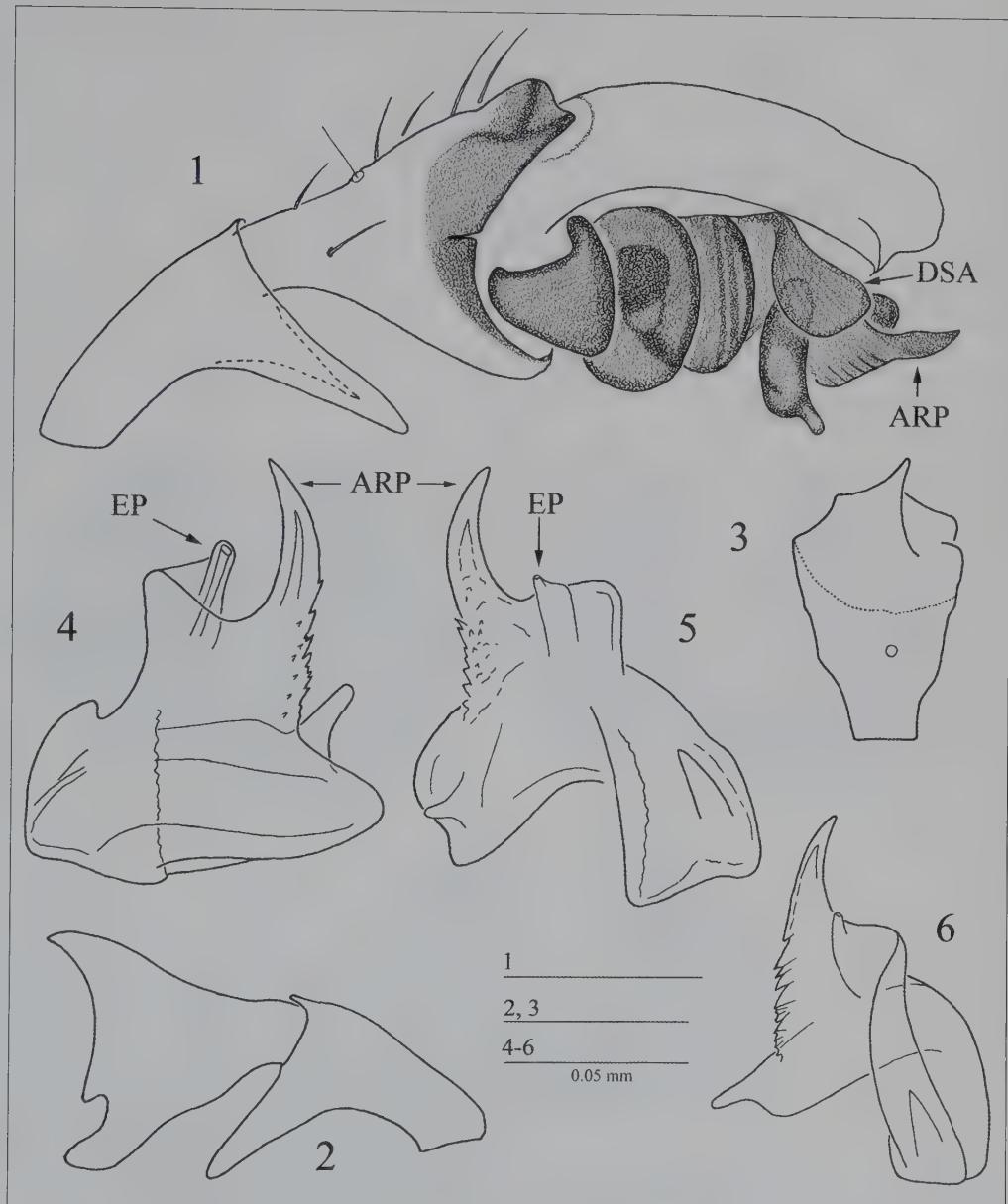
Genus *Mermessus* O. Pickard-Cambridge, 1899

Type species: *Mermessus dentiger* O. Pickard-Cambridge, 1899.

Mermessus fradeorum (Berland, 1932)

Figures 12–19

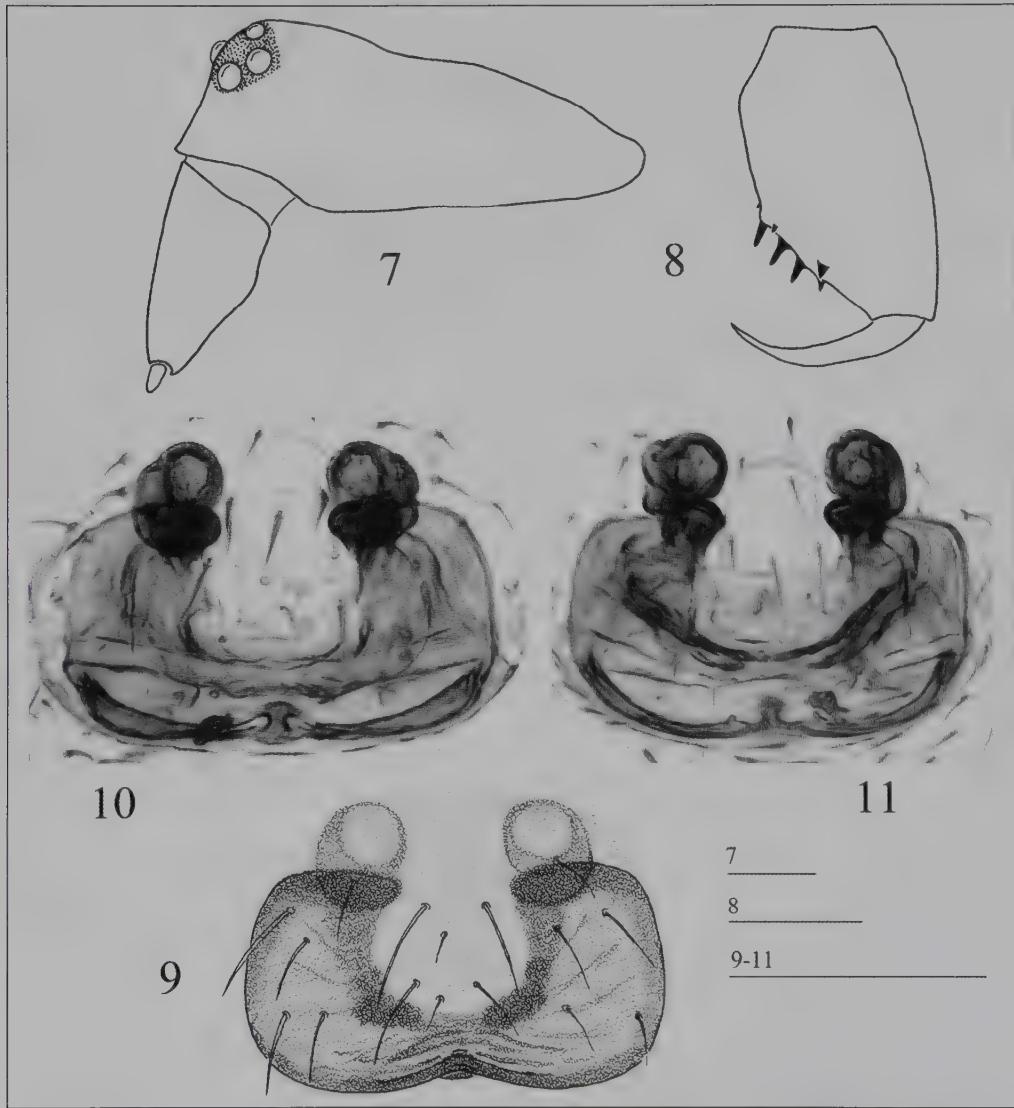
Specimens examined: Al-Ain, 1♂, 1♀, 13.iii.2005, hand-collecting. Al-Ajban, 1♂, 28.xii.2005–29.i.2006,



Figures 1–6. *Erigone autumnalis* Emerton, 1882, male. 1: Right palp, dotted line - variation in patellar process; 2: Palpal patella and tibia, retrolateral view; 3: Palpal tibia; 4–6: Embolic division, various aspects.

MT & LT; 5♂, 26.ii–2.iv.2006, MT; 1♀, 9–16.iv.2006, MT. Dubai, Mushrif Park, 1♀, 6.iii.2005, hand-collecting. Sharjah Desert Park, 1♀, 28.v–4.vi.2007, LT.

Remarks: This species was earlier listed under *Eperigone* Crosby & Bishop, 1928, synonymized by Miller (2007).

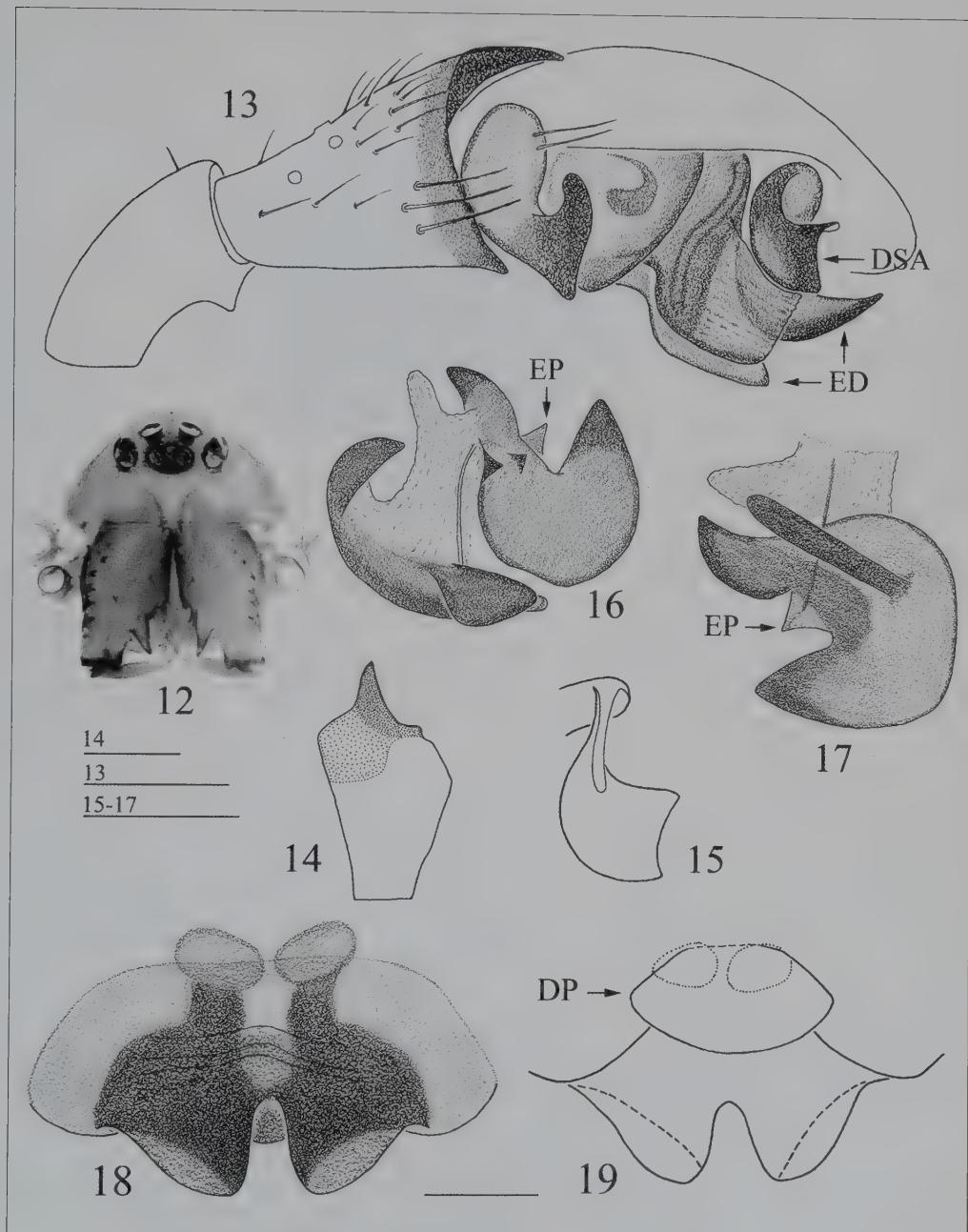


Figures 7–11. 7: *Erigone autumnalis* Emerton, 1882: Male, carapace; 8: Male, chelicera; 9: Female, epigyne, ventral view; 10, 11: Female, vulva, ventral and dorsal views, respectively.

Distribution: Nearctic, Azores, South Africa (Millidge, 1987), China (Gao et al., 1994) introduced to New Zealand and Polynesia (Beatty et al., 1991).

Subfamily **Micronetinae** Hull, 1920

Genus ***Agyneta*** Hull, 1911



Figures 12–19. *Mermessus fradeorum* (Berland, 1932). 12–17: Male. 12: Carapace, frontal view; 13: Right palp; 14: Palpal tibia; 15: Suprategular apophysis; 16, 17: Embolic division, various aspects; 18–19: Female, epigyne, 18: Ventral view, 19: Dorsal view.

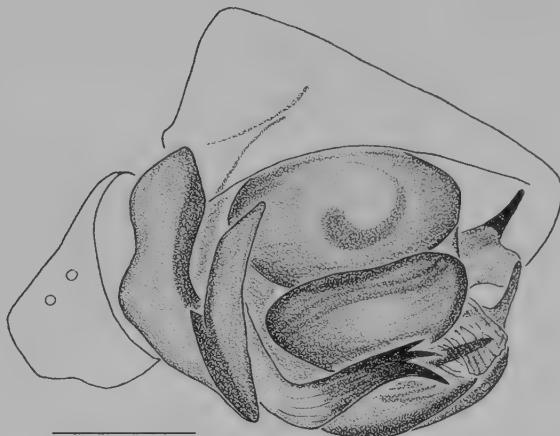


Figure 20. *Agyneta fuscipalpa* (C.L. Koch, 1836), male palp.

Type species: *Neriene decora* O. Pickard-Cambridge, 1871.

***Agyneta fuscipalpa* (C.L. Koch, 1836)**

Specimens examined: Fujairah, 1♂, 8–29.iv.2006, LT.

Distribution. Widespread in the southern Palaearctic from Europe and North Africa in the West to China in the East.

Figure 20

***Agyneta paraprosecta* Tanasevitch nov. spec.**

Figures 21–27
Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Shawkah (25°08'N, 56°01'E), 1–7.iv.2007, water traps, leg. A. van Harten.

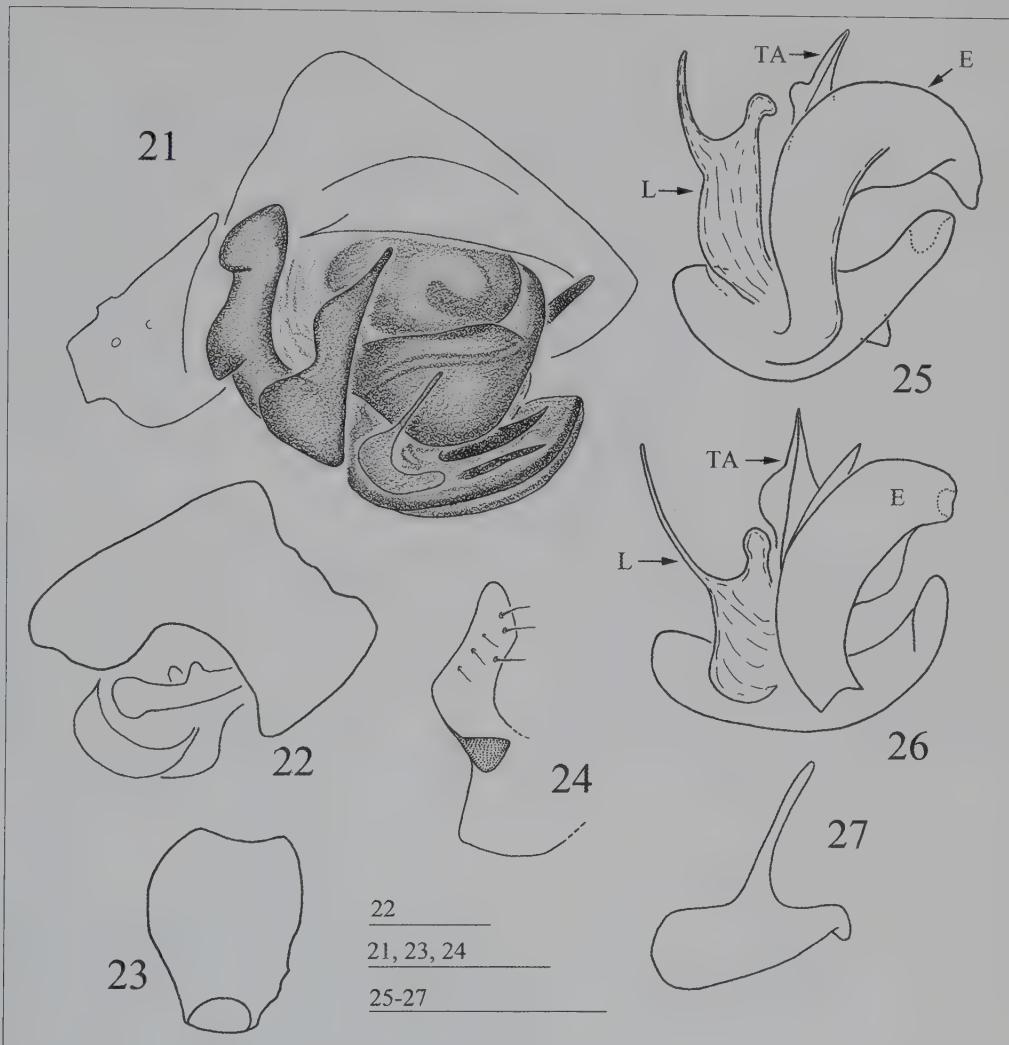
Diagnosis: The new species is diagnosed but the peculiar shape of the lamella characteristic. Description: Male. Total length 1.75. Carapace 0.75 long, 0.55 wide, grayish brown. Chelicerae 0.38 long, laterally with a row of small teeth. Legs yellow. Leg I 2.83 long (0.75+0.20+0.75+0.65+0.48), IV 2.66 long (0.75+0.15+0.65+0.68+0.43). Chaetotaxy: TiI-IV: 2-0-0-0; MiI-IV: 0-0-0-0. TmI - 0.39. Metatarsi IV without trichobothrium. Palp as in Figures 21–27. Abdomen 1.03 long, 0.95 wide, grey.

Female. Unknown.

Comparative material examined:

Agyneta prosectes (as *Meioneta*): SUDAN: Darfur Prov., Golol, west slope of Djibel Mauva (13°00'N 25°00'E), 1340 m a.s.l., 1♂ (RMCA #127525), xi.1964, leg. J.L. Cloudsley-Thompson. MALI: Lutana, 2♂ (RMCA #136838), viii-ix.1969, leg. G. Pierrard. KENIA: Mt. Kenya (00°10'S 37°20'E), 3150 m a.s.l., 1♂ (RMCA #150214), 31.vii.1975, leg. R. Bosmans; Mt. Kenya (00°10'S 37°20'E), 2650 m a.s.l., 2♂, 1♀ (RMCA #150216), 31.viii.1975, leg. R. Bosmans; SENEGAL: S of Richard Toll (16°20'N 15°30'W), savanna, 2♀ (RMCA #170672), 15.ix.1989, leg. J. Everts; same, 1♂ (RMCA #170673), 2.ix.1989, leg. J. Everts. NIGERIA: Ibadan, I.I.T.A. (07°14'N 03°30'E), cultivated plots, 8♂, 10♀ (RMCA #177476), 11–16.iv.1973, leg. A. Russell-Smith. ETHIOPIA: Addis Ababa, Shola, ILCA compound (09°02'N 38°42'E), in long grass in field, 2400 m a.s.l., 2♂ (RMCA #224455), 1.x.1980, leg. A. Russell-Smith.

Agyneta prosectoides (as *Meioneta*): CAMEROON: Mt. Manengouba (05°00'N 09°50'E), litter of solitary tree in grassland, 2000 m a.s.l., 1♂ (RMCA #163140), 24.iii.1983, leg. R. Bosmans; Bambothos (05°44'N 10°04'E), pitfall, 2180 m a.s.l., 1♂ (RMCA #163141), 17.i.1983, leg. J. van Stalle.



Figures 21–27. *Agyneta paraprosecta* Tanasevitch nov. spec., male. 21, 22: Right palp, retrolateral and prolateral views, respectively; 23: Palpal tibia; 24: Paracymbium, distal part removed; 25, 26: Embolic division.

Taxonomic remarks: The new species is very similar to both Afrotropical *A. prosectes* occurs in Angola, Kenya, Sudan, South Africa, Cameroon, Ivory Coast, Mali and St. Helena Island, and *A. prosectoides* recorded from Nigeria and Cameroon (see Scharff, 1990), but differs well by the absence of a tooth on a base of the embolus and a shorter lower branch of the lamella characteristic.

Etymology: The species name *paraprosecta* emphasizing that the new species is closely related to both *Agyneta prosectes* (Locket, 1968) and *A. prosectoides* (Locket & Russell-Smith, 1980); adjective.

Genus ***Mughiphanes*** Saaristo & Tanasevitch, 1999

Type species: *Linyphia mughi* Fickert, 1875.

***Mughiphanes edentulus* Tanasevitch nov. spec.**

Figures 28–33

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Midaq ($25^{\circ}18'N$ $56^{\circ}07'E$), in yellow & white water traps, 7–14.iii.2006, leg. A. van Harten. Paratypes: 1♂, Wadi Midaq, together with holotype; 1♀, 29.iii–10.iv.2006, WT.

Description. Male. Total length 1.75. Carapace 0.75 long, 0.65 wide, brown. Chelicerae 0.38 long. Legs pale yellow. Leg I 3.64 long ($0.95+0.23+0.95+0.93+0.58$), IV 3.29 long ($0.88+0.20+0.83+0.88+0.50$). Chaetotaxy: TiI: 2-1-1-0, II: 2-0-1-0, III-IV: 2-0-0-0; MtI-III: 1-0-0-0. TmI – 0.17. Metatarsi IV without trichobothrium. Palp (Figs 28–30): Cymbium with a posterodorsal, upwards slightly curved outgrowth. Paracymbium toothless. Lamella characteristic wide, slightly narrowed medially. Terminal apophysis large, complex, distally with a narrow and serrate outgrowth directed orthogonally to sclerite's main axis. Embolus with a large thumb. Fickert's gland oval. Abdomen 1.00 long, 0.70 wide, dorsal pattern present, but unclear as a result of damaged integuments in both males.

Female. Total length, 2.00. Carapace 0.78 long, 0.60 wide, pale brown. Chelicerae 0.31 long. Legs pale brown. Leg I 3.52 long ($0.93+0.25+0.88+0.88+0.58$), IV 2.41 long ($0.75+0.20+0.45+0.58+0.43$). Chaetotaxy as in male. TmI - 0.21. Abdomen partly damaged, 1.38 long, dorsally pale grey, with median stripe widened backward. Epigyne (Figs 31–33): Proscape anchor-shaped, middle part of scape half as narrow as distal part of proscape; lateral lobes reduced, stretcher short and wide.

Taxonomic remarks. The new species shows some similarities to *Leptyphantes nigropictus* Bosmans, 1979, from Kenya, in male palp and epigyne conformation, but differs well by the shape of the lamella characteristic and terminal apophysis.

Etymology: The specific name is derived from the toothless paracymbium; adjective.

Genus ***Nesioneta*** Millidge, 1991

Type species: *Nesioneta lepida* Millidge, 1991.

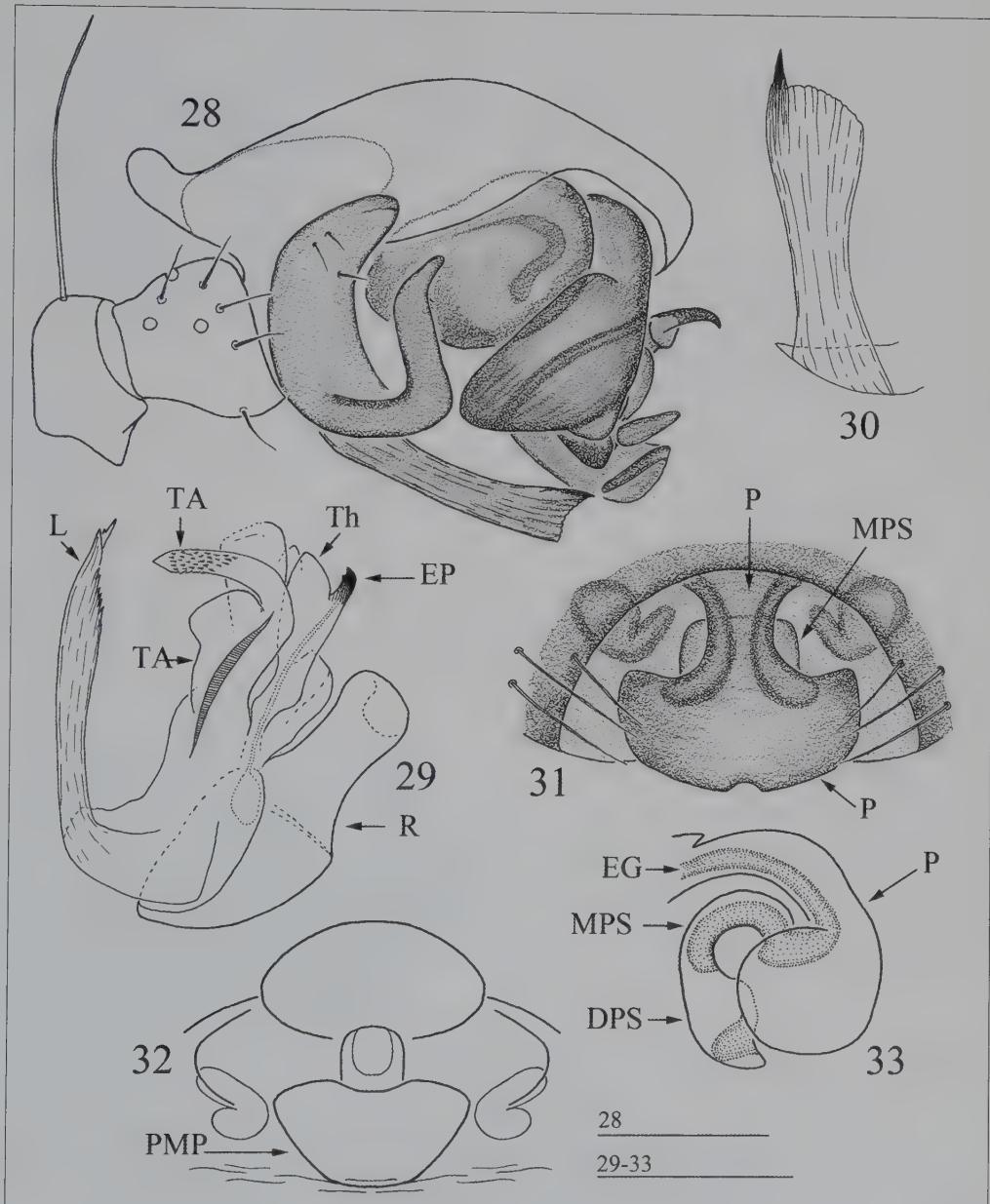
***Nesioneta arabica* Tanasevitch nov. spec.**

Figures 34–40

Specimens examined: Holotype: ♂, United Arab Emirates, Hatta ($24^{\circ}49'N$ $56^{\circ}07'E$), 4–11.iv.2006, in light-trap, leg. A. van Harten. Paratypes: 1♂, 1♀, together with holotype. 1♂, al-Ajban, 9.xi–7.xii.2005, LT & MT. 1♂, Bithnah, 31.xii.2005–2.ii.2006, LT. 1♀, Fujairah, 20–27.v.2006, LT. 1♂, 4♀, Hatta, 19–28.iii.2006, LT; 4♀, 8–26.iv.2006, LT; 3♂, 1♀, 24–30.v.2006, LT. 1♂, Khor al-Khwair, 8–14.iii.2007, LT; 1♀, 15–22.iii.2007, LT. 1♂, Sharjah Desert Park, 25.ii–25.iii.2006, LT; 1♂, 21.i–17.ii.2008, PT. 2♀, 1♂, 2♀, Sharjah-Khor Kalba, near tunnel, 16–31.i.2006, LT. 1♂, Wadi Bih dam, 22.ii–1.iii.2007, LT; 1♂, 2♀, 15–22.iii.2007, LT; 1♂, 29.iii.2007, sweep-net, leg. F. Menzel; 1♂, 1♀, 2–4.iv.2009, WT. 2♀, Wadi Midaq, 21.xii.2005–2.ii.2006, LT; 1♂, 2–16.ii.2006, LT; 1♀, 29.iii–10.iv.2006, LT; 2♂, 1♀, 27.iv–4.v.2006, LT. 1♀, Wadi Shawkah, 19–22.v.2007, WT. 2♂, 1♀, Wadi Wurayah farm, 17–24.iii.2009, MT; 2♂, 15–30.iii.2009, LT; 2♂, 2♀, 24–30.iii.2009, MT.

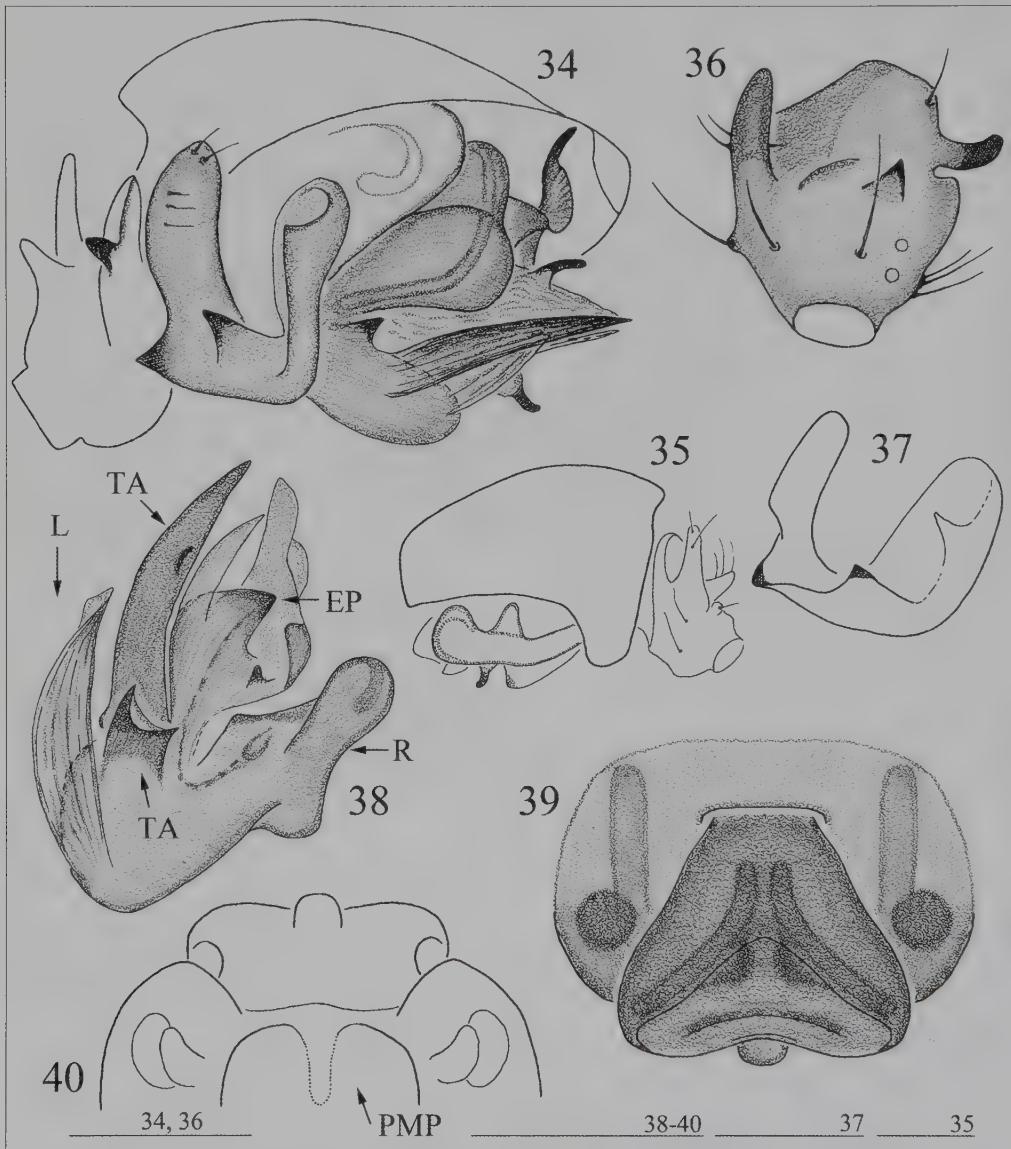
Diagnosis: The new species can be distinguished from other congeners by the peculiar shape of the male palpal tibia and lamella characteristics, as well as by the conformation of the vulva.

Description: Male. Total length 1.73. Carapace 0.75 long, 0.50 wide, unmodified brownish yellow. Chelicerae 0.35. long. Legs yellow. Leg I 2.76 long ($0.73+0.18+0.75+0.65+0.45$), IV 2.59 long ($0.70+0.15+0.68+0.63+0.43$). Chaetotaxy: TiI–IV: 2-0-0-0; all metatarsi unarmed. Metatarsi I–III each with a trichobothrium. TmI - 0.30. Palp (Figs 34–38): Palpal tibia with two long and one short process, latter pointed in dorsal view. Paracymbium with two tooth-like outgrowths, one on proximal, the other in middle part. Lamella characteristic relatively



Figures 28–33. *Mughiphantes edentulus* Tanasevitch nov. spec. 28–30: Male. 28: Right palp; 29: Embolic division; 30: Lamella characteristic; 31–33: Female. 31, 32: Epigyne, ventral and dorsal views, respectively; 33: Scapus.

long, gradually narrowing distad. Embolus large and complex. Abdomen 0.93 long, 0.53, dorsally grey with a wide, white, transverse stripe and a pale area before spinnerets. In melanic samples, abdomen almost black, pale areas poorly visible.



Figures 34–40. *Nesoneta arabica* nov. spec. 34–38: Male. 34, 35: Right palp, retrolateral and prolateral views, respectively; 36: Palpal tibia; 37: Paracymbium; 38: Embolic division; 39–40: Female, epigyne, ventral and dorsal view, respectively.

Female. Total length 1.88. Carapace 0.75 long, 0.53 wide. Chelicerae 0.30 long. Leg I 2.51 long ($0.70+0.20+0.63+0.55+0.43$), IV 2.56 long ($0.73+0.20+0.63+0.60+0.40$). TmI - 0.26. Abdomen 1.15 long, 0.78 wide. Epigyne (Figs 39, 40): Proscape trapezoid. Body and leg colouration, as well as chaetotaxy as in male.

Variability: Abdominal pattern variable from pale to almost black in both sexes; epigyne colouration from yellow to dark brown.

Taxonomic remarks: The new species differs well from the other congeners by the long processes on the palpal tibia, as well as by the trapezoid proscape. The epigyne shows similarities to that of *Nesianeta muriensis* (Wunderlich, 1973) **comb. nov.** ex of *Agyneta* Hull, 1911, described from the female from Nepal by Wunderlich (1973).

Etymology: The species name is derived from the area whence it has been found; adjective.

CONCLUSION

At present, the linyphiid fauna of the United Arab Emirates is known to contain seven species. The country is located near or even at the border some authors draw between the Palaearctic and Oriental regions (e.g. Wallace, 1876), and some others between the Palaearctic and Afrotropical realms (e.g. Heptner, 1936). This fauna is indeed as if intermediate between these of the above three biogeographical regions: Palaearctic and Oriental relations are supported by one species each: *Agyneta fuscipalpa* and *Nesianeta arabica* nov. spec, respectively; Afrotropical relations are demonstrated by two species: *Mughiphantes edentulus* nov. spec. and *Agyneta paraprosecta* nov. spec.

ACKNOWLEDGEMENTS

I am very grateful to Antonius van Harten (Sharjah, United Arab Emirates) who collected the majority of material for the present study, and to Dr. Rudy Jocqué (Tervuren, Belgium) for certain comparative material he sent me from the Royal Museum for Central Africa. The study was supported in part by the Russian Foundation for Basic Research, Projects № 09-04-01365-a and № 08-04-92230-a.

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Order Araneae, family Salticidae

Wanda Wesołowska and Antonius van Harten

INTRODUCTION

The Salticidae ('jumping spiders') is possibly the largest family of spiders with over 5000 known species worldwide (Platnick, 2000). There are only a few recent papers on the Salticidae of the Near East. They deal with Yemen (Wesołowska & van Harten, 1994, 2007), the Levant (Prószyński, 2000, 2003) and Saudi Arabia (Prószyński, 1989, 1993). Despite these works, the jumping spiders of the region are still insufficiently known, and many areas remain completely unstudied. One of such blanks was the United Arab Emirates, this paper filling the gap by presenting the first data on the salticids from this country. Thirty species are reported, among them eleven described as new: *Aelurillus galinae* nov. spec., *Heliophanillus conspiciendus* nov. spec., *Heliophanillus metallifer* nov. spec., *Menemerus affinis* nov. spec., *Plexippus minor* nov. spec., *Pseudicius fayda* nov. spec., *Pseudicius mushrif* nov. spec., *Rafalus arabicus* nov. spec., *Rafalus desertus* nov. spec., *Rafalus minimus* nov. spec., and *Yllenus logunovi* nov. spec. The unknown sexes of two species are described for the first time, viz. the male of *Rafalus feliksi* Prószyński, 1999, and the female of *Pellenes hedjazensis* Prószyński, 1993. One specific name is synonymised: *Neaetha murphyorum* Prószyński, 2000, with *N. oculata* (O. P.-Cambridge, 1876).

MATERIALS AND METHODS

The specimens studied were collected during 2004–2009, in different places, habitats and periods of the year. Varied sampling procedures were used to collect individuals; pitfall traps for catching ground-living spiders, water traps, light traps, and Malaise traps. In addition to these systematic sampling techniques, sometimes hand collecting was also applied. If not stated otherwise, specimens were collected by A. van Harten.

Catches were preserved in 70% ethanol. Specimens were examined in a Petri dish with ethanol. Descriptions of colours refer to wet specimens. The drawings were made with the aid of a reticular eyepiece attached to a stereomicroscope. The epigynes and the male pedipalps were removed for study. The epigynes were macerated in hot 5% KOH for a few minutes and cleared in eugenol. After drawing, the genitalia were placed in micro-vials with ethanol and put into the vials containing the specimens from which they had been removed. Terminology is standard for Araneae. All measurements are given in millimetres.

The holotypes and part of paratypes of newly described species are deposited in the Musée Royal de l'Afrique Centrale in Tervuren (Belgium) [MRAC], two paratypes in Museum of Natural History at Wrocław University (Poland) [NHM]. Remaining specimens, among them several paratypes, are kept in the UAE Invertebrate Collection [UAEIC].

Abbreviations used: HC = hand-collected; MT = Malaise trap; LT = light trap; PT = pitfall trap; WT = water trap; NARC = National Avian Research Centre.

Photographs made by Barbara Knoflach, Innsbruck, Austria, of live specimens collected in Yemen by the second author are included, as they give additional information on the appearance of those species

SYSTEMATIC ACCOUNT

Aelurillus galinae Wesołowska & van Harten nov. spec.

Plates 1–2, Figures 1–7

Specimens examined: Holotype: ♂, United Arab Emirates, Sharjah Desert Park, 25°17'N 55°42'E, 1–30.xi.2008, in pitfall trap, leg. A. van Harten (MRAC). Paratypes: 2♂, 1♀, same data as holotype. 1♀, same locality but 1–12.ii.2009, PT; 1♂, 16.iii.2009, WT, leg. C. Schmid-Egger.

Diagnosis: The species is easily distinguished by shape of anterior edge of carapace, with retreating anterior median eyes. The male is distinguishable by the presence of bended dorsal apophysis of palpal tibia. The female is difficult to recognise from congeners, but ventral structure of epigyne may be characteristic (long entrance ‘bowls’ of seminal ducts, simple structure of receptacles).

Description: Measurements (male/female). Cephalothorax length 1.5–1.6/1.7–1.8, width 1.2–1.4/1.3–1.4, height 0.8–0.9/0.8–1.0. Abdomen length 1.4–1.6/1.9–2.2, width 1.0–1.1/1.9–2.2. Eye field length 0.6–0.7/0.7–0.8, anterior width 0.8–0.9/1.0, posterior width 0.7–0.8/0.9.

Male. Small spider with short eye field (Plate 1). Carapace brown, eye field blackish. White hairs form four thin lines on eye field, merging in two wider streaks on thoracic part (Fig. 1), remaining part of ocular area covered with yellowish fawn hairs. Anterior eyes surrounded by whitish scales. Anterior lateral eyes placed clearly above anterior median ones (Fig. 2), they protrude beyond contour of carapax (when seen from above as in Figure 1). Clypeus brown, laterally white hairs on ‘face’ (Fig. 2). Chelicerae light brown with line composed of dark hairs (Fig. 2). Labium and sternum light brown, gnathocoxae brown with yellow tips. Abdomen yellow with wide median brown band, venter light. Spinnerets greyish. Legs yellow, first tibia slightly darker with blackish hairs on ventral surface, light hairs on tibia and metatarsus. Spines long. Pedipalps light, clothed in dense white hairs. Palp structure as in Figures 3–5, two short tibial apophyses, dorsal one weakly sclerotised, slightly bent to retrolateral side (Fig. 5).

Female. General appearance as in Plate 2. Cephalothorax as in male, but white stripes poorly contrasted. Position of eyes of first row as in male (Plate 4). Abdomen swollen, spherical, covered by mosaic of greyish and fawn patches. Dorsum of abdomen clothed in delicate short brown and grey hairs, among them sparse longer brown bristles. Legs yellow with brown spots. Epigyne typical for the genus, weakly sclerotised (Fig. 6), with copulatory openings shielded by ‘wings’, receptacles composed of two parts (Fig. 7).

Etymology: The species is dedicated to Dr Galina Azarkina, eminent salticid specialist, who has revised numerous species of the genus *Aelurillus*.

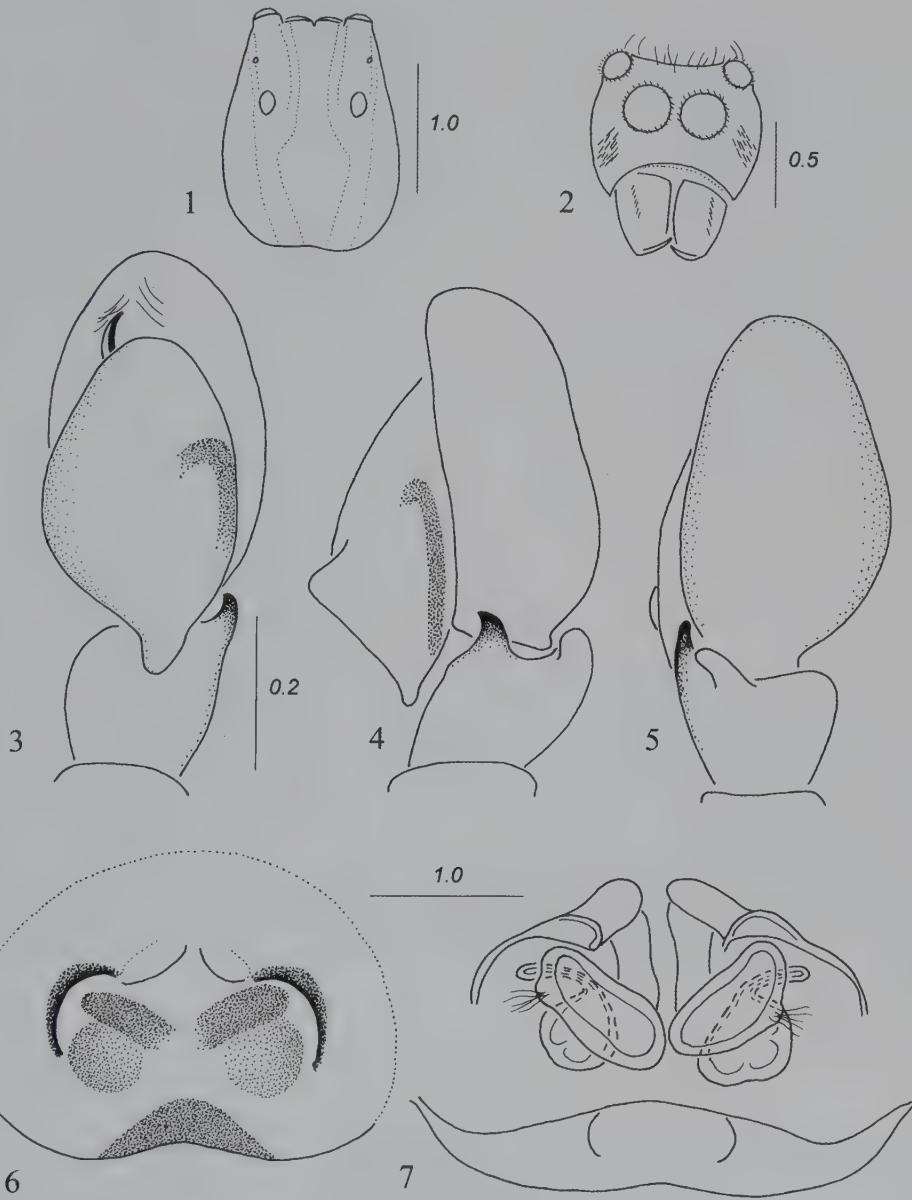
Aelurillus kochi Roewer, 1951

Plates 3–4, Figures 8–10

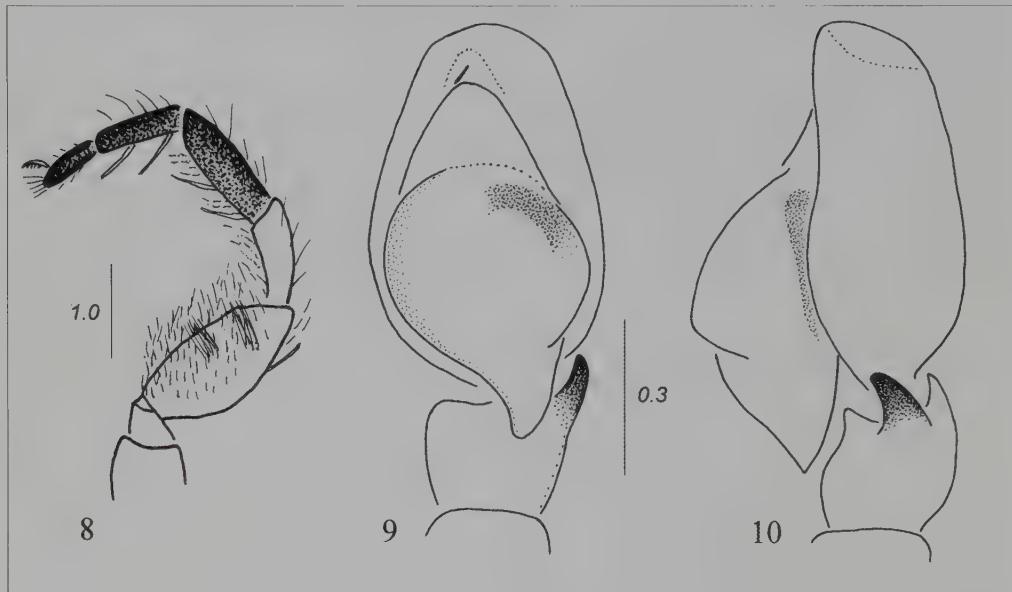
Specimens examined: N of Ajman, 1♂, 21–25.x.2007, WT; 1♂, 11–25.xi.2006, WT.

Description: Measurements. Cephalothorax length 2.3–2.7, width 1.8–1.9, height 1.0–1.1. Abdomen length 2.3–2.6, width 1.6–1.9. Eye field length 0.8–1.0, anterior width 1.2–1.4, posterior width 1.1–1.2.

Male. Medium-sized, hairy spider (Plate 3). Carapace dark, densely covered with greyish hairs, on lateral slopes hairs fawn. Three longitudinal light streaks on eye field formed by white hairs, near eyes some brown long setae. Anterior eyes surrounded by fawn small scales. Clypeus with white hairs, chelicerae orange (Plate 4). Labium and gnathocoxae orange with white margins, sternum almost black. Abdomen dark grey, clothed in light hairs, venter whitish. Spinnerets yellow. Legs whitish yellow, covered with light hairs with admixture of brown ones, spines brown, scopulae dark. First leg with black tibia, metatarsus and tarsus (Fig. 8), femur bears dense white hairs, on retrolateral surface with two tufts of fawn ones.



Figures 1–7. *Aelurillus galinae* nov. spec. 1: Carapace of male in dorsal view; 2: Same in frontal view; 3: Palpal organ in ventral view; 4: Same in lateral view; 5: Same in dorsal view; 6: Epigyne; 7: Internal structure of epigyne.



Figures 8–10: *Aelurillus kochi* Roewer. 8: First leg; 9: Palpal organ in ventral view; 10: Same in lateral view.

Pedipalps white, densely covered with long white hairs, but cymbium and bulb blackish. Palp structure as in Figures 9 and 10. Description of female: See Prószyński (2003). Distribution: So far only known from Greece, Syria and Israel. New to the UAE.

Bianor albobimaculatus (Lucas, 1846)

Specimens examined: N of Ajman, 1♂, 1–19.ix.2007, WT. Near al-Hayer, 1♀, 14.iii.2005, HC. Wadi Shawkah, 1♂, 1–9.iv.2007, WT; 3♂, 4♀, 5–12.v.2007, WT; 4♂, 19–22.v.2007, WT; 4♂, 5♀, 9–24.vi.2007, WT; 4♂, 1♀, 30.vi–2.viii.2007, WT; 1♂, 19–28.xi.2007, WT; 1♂, 3–18.ii.2008, WT; 1♀, 17.viii–11.ix.2008, WT; 1♂, 24.ii.2009, HC, leg. M. Jaschhof. Wadi Wurayah, 1♂, 26.xi.2006, HC, leg. J.-L. Gattoliat; 1♂, 14.xi–4.xii.2007, MT.

Description: See Logunov (2000).

Distribution: Widely distributed in the Afrotropical Region, in Mediterranean and Turkmenian subregions of the Palaearctic and the north-western Orient. New to the UAE.

Cyrba ocellata (Kroneberg, 1875)

Fig. 11

Specimens examined: Wadi Shawkah, 1♀, 5–12.v.2007, WT.

Description: Measurements. Cephalothorax length 2.6 mm, width 2.0 mm, height 1.1 mm. Abdomen length 4.0 mm, width 2.4 mm. Eye field length 1.3 mm, anterior width 2.0 mm, posterior width 1.8 mm.

Description of male see Wanless (1984) and Wesołowska & Tomasiewicz (2008).

Female. Medium-sized spider. Carapace low, elongated; eye field short, anteriorly slightly wider; fovea long, sulciform. Colouration of carapace light brown, short yellowish hairs on eye field, eyes surrounded by black rings, fringed by whitish hairs, long brown bristles near eyes. Chelicerae brown, three teeth on promargin, five on retromargin. Mouthparts light



Plates 1–4: 1: *Aelurillus galinae* nov. spec., male; 2: *Aelurillus galinae* nov. spec., female; 3: *Aelurillus kochi* Roewer, male; 4: *Aelurillus kochi* Roewer, male, frontal view.

brown with pale tips, sternum orange, oval. Abdomen elongated, narrower than carapace, yellowish grey, clothed in delicate grey hairs. Venter yellow. Spinnerets yellowish grey. Legs orange, hairy, especially tibiae and metatarsi of first pair. Spines brown. Epigyne strongly sclerotised, with median notch in posterior edge (Fig. 11).

Distribution: Widespread pantropical species, known from Eastern Africa, Central Asia, Southern Orient and Eastern Australia. New to the UAE.

Evarcha dotata (Peckham & Peckham, 1903)

Specimens examined: Wadi Wurayah, 1♀, 10–26.xii.2006, MT.

Description: See Wesołowska & van Harten (1994, 2007).

Distribution: The species is widely distributed in the Afrotropical Region, from the Arabian Peninsula hitherto only known from Yemen. New to the UAE.

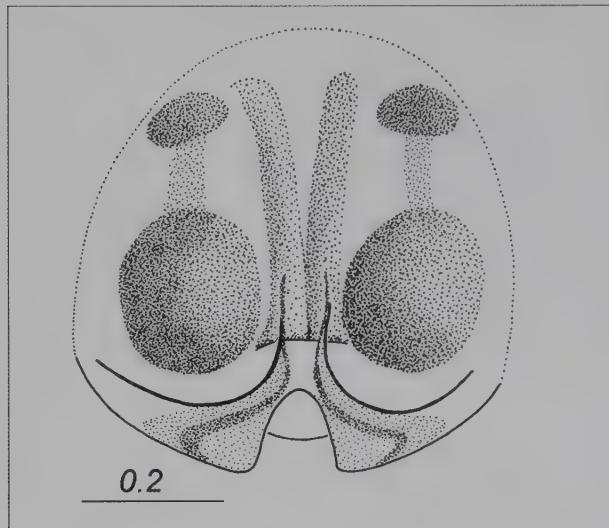


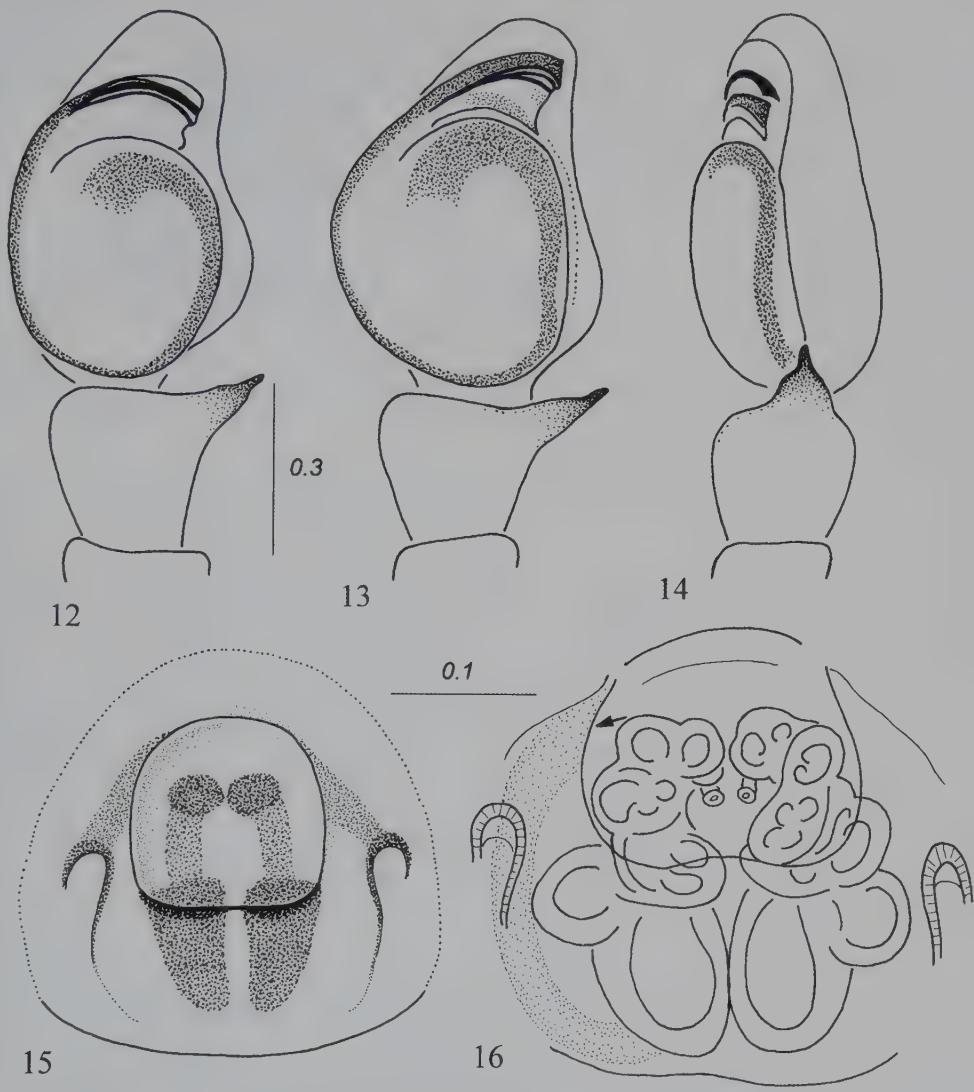
Figure 11. *Cyrba ocellata* (Kroneberg), epigyne.

***Evarcha seyun* Wesołowska & van Harten, 2007**

Plates 5–6, Figures 12–16

Specimens examined: Al-Ajban, 1♂, 9.xi–7.xii.2005, LT; 1♀, 2–22.xi.2006, MT. N of Ajman, 7♂, 1♀, 16.ix–12.x.2006, WT; 4♂, 11–25.xi.2006, WT; 1♂, 9–28.xii.2006, WT; 5♂, 1♀, 1–19.ix.2007, WT; ♂, 3♀, 21–25.x.2007, WT. 7 km S of al-Jazirat al-Hamra, 1♂, 22.xii.2004, WT; 1♀, 4.i.2005, HC; 1♀, 27.ii.2006, HC. Jebel Hafit, 1♀, 8.iv.2005, HC. Khor Kalba lagoon, 1♂, 7.iv.2005, HC; 1♂, 26.ii.2006, HC. Khor al-Khwair, 2♂, 7–14.iv.2007, LT; 1♀, 2–13.v.2007, LT. Near Mahafiz, 1♂, 21–28.iii.2006, LT. Near Qurraya, 2♂, 5–30.xi.2008, WT. Sharjah, 1♀, 15.xi.2004, HC. Sharjah Desert Park, 1♂, 12–21.v.2007, LT; 1♂, 28.v–4.vi.2007, LT; 1♂, 1♀, 1–30.xi.2008, PT; 1♂, 11.xii.2008–6.i.2009, LT; 3♂, 1–12.ii.2009, PT. Sharjah-Ajman, 1♂, 2.xii.2004, HC. Wadi Maidaq, 1♂, 27.xi–22.xii.2005, LT; 5♂, 28.xi–1.xi.2005, WT; 5♂, 3♀, 26.xii.2005–2.i.2006, WT; 2♂, 14–25.i.2006, WT; 5♂, 5♀, 4–15.ii.2006, WT; 3♂, 1♀, 7–14.iii.2006, WT; 1♂, 29.iii–10.iv.2006, WT; 4♂, 3♀, 24.ix–22.x.2006, WT; 4♂, 26.x–9.xi.2006, WT; 4♂, 18.xi–15.xii.2007, PT; 3♂, 3–17.ii.2008, WT; 1♂, 3–17.ii.2008, WT; 1♂, 20.i–3.ii.2008, WT; 2♂, 8–12.vi.2008, WT. Wadi Bih dam, 1♀, 24–29.vi.2008, LT. Wadi Safad, 3♂, 27.xi–22.xii.2005, WT; 3♂, 1♀, 26.xii.2005–2.i.2006, WT. Wadi Shawkah, 9♂, 1♀, 31.x–27.xi.2006, WT; 1♂, 19–22.v.2007, WT; 5♂, 1♀, 9–24.vi.2007, WT; 6♂, 3♀, 5–12.v.2007, WT; 11♂, 3♀, 30.vi–2.viii.2007, WT; 2♂, 1♀, 19–28.xi.2007, WT; 2♂, 20.i–18.ii.2008, WT; 1♂, 3–18.ii.2008, WT; 1♂, 25.v–12.vi.2008, WT; 2♂, 1♀, 11.viii–11.ix.2008, WT. Wadi Siji, 1♂, 24.ix–12.x.2006, WT. Wadi Wurayah, 1♂, 12–14.iv.2005, MT, leg. T. Pape; 3♂, 8–12.vi.2006, WT; 6♂, 1♀, 10–26.xi.2006, WT; 10♂, 2♀, 5–30.xi.2008, WT.

Description. Measurements (male/female). Cephalothorax: length 2.2–2.3/2.4–2.6, width 1.6–1.7/1.7–1.9, height 1.0/1.0–1.1. Abdomen: length 2.0–2.3/2.3–2.7, width 1.3–1.5/1.6–1.8. Eye field: length 0.9–1.0/0.9–1.1, anterior width 1.4–1.5/1.5–1.6, posterior width 1.5–1.6/1.6–1.7. Male. General appearance in Plate 5. Small spider. Carapace rounded, dark brown, darker at its posterior margin, black in vicinity of eyes. Eyes of anterior row surrounded by fawn scales. White, dense hairs form large light patch on ocular area, sometimes divided by two longitudinal thin fawn lines. On thorax white semi-lunar patch, its ends extend to clypeus. In some specimens tufts of long dark hairs form ‘horns’ near lateral median eyes. Chelicerae and labium brown, gnathocoxae brown with yellowish chewing margins. Sternum brownish.



Figures 12–16. *Evarcha seyun* Wesołowska & van Harten. 12: Palpal organ in ventral view; 13: Same in dorsoventral view; 14: Same in lateral view; 15: Epigyne; 16: Internal structure of epigyne.

Abdomen dark brown with white anterior margin and wide longitudinal median band not extending to its end (Plate 5). Venter yellow with large triangular dark grey spot. Dense hairs in background colour cover whole abdomen, among them sparse long brown setae. Spinnerets dark. Legs light brown with darker rings, basal parts of femora yellow. First pair in some specimens dark brown. Spines numerous, brownish. Pedipalps yellowish brown. Bulb rounded, single tibial apophysis short, obtuse on its tip (Fig. 14). Embolus with accompanying spatula-shaped structure (Figs 12, 13).

Female. General appearance in Plate 6. Slightly larger than male, colouration lighter. Carapace brown, near eyes darker, densely clothed in whitish hairs, among them sparse brown bristles, denser at anterior eyes. Tufts of long dark setae near smallest eyes. Clypeus with white hairs. Abdomen yellowish, with median streak formed by few pairs of poorly contrasting whitish spots (Plate 6). Epigyne with central rounded depression and two pockets located laterally (Fig. 15). Internal structure of epigyne as in Figure 16, seminal ducts weakly sclerotised, receptacles large, strongly sclerotised, multi-chambered.

Distribution: Hitherto known only from Yemen. New to the UAE.

***Heliophanillus consciendus* Wesołowska & van Harten nov. spec.**

Figs 17–21

Specimens examined: Holotype: ♂, United Arab Emirates, N of Ajman, 25°29'N 55°25'E, 1–19.ix.2007, in water trap, leg. A. van Harten (MRAC). Paratypes: 2♂, same data as holotype. 2♂, same locality but 16.ix–12.x.2006, WT; 2♂, same locality but 21–25.x.2007, WT.

Diagnosis: The male of the species is recognizable by the shape of tibial apophyses and by the embolus bent towards the apophyses (Fig. 18), i.e. in the direction opposite to other congeners.

Description: Measurements. Cephalothorax length 1.4–1.6, width 1.0–1.1, height 0.6–0.7. Abdomen length 1.6–1.7, width 1.0–1.1. Eye field length 0.5–0.6, anterior width 0.9–1.0, posterior width 1.0–1.1.

Male. Diminutive, dark coloured spider. Carapace low, oval, dark brown, eye field black with metallic shine. Delicate, colourless hairs cover carapace, longer dark bristles on eye field. White hairs form light line along lateral edges of carapace. Mouthparts brown with paler margins, sternum yellowish tinged with grey. Abdomen ovoid, black with three pairs of white spots (Fig. 17), spots of anterior pair extended to streak on sides of abdomen. Shiny scales clinging to dorsum cover abdomen. Venter light, yellowish orange tinged with grey. Anterior spinnerets light, posterior black. Legs light yellow, their hairs and spines brown. Pedipalps brown. Palpal femur without apophyses, two big apophyses on tibia (Figs 19, 20), tegulum irregular (Fig. 18).

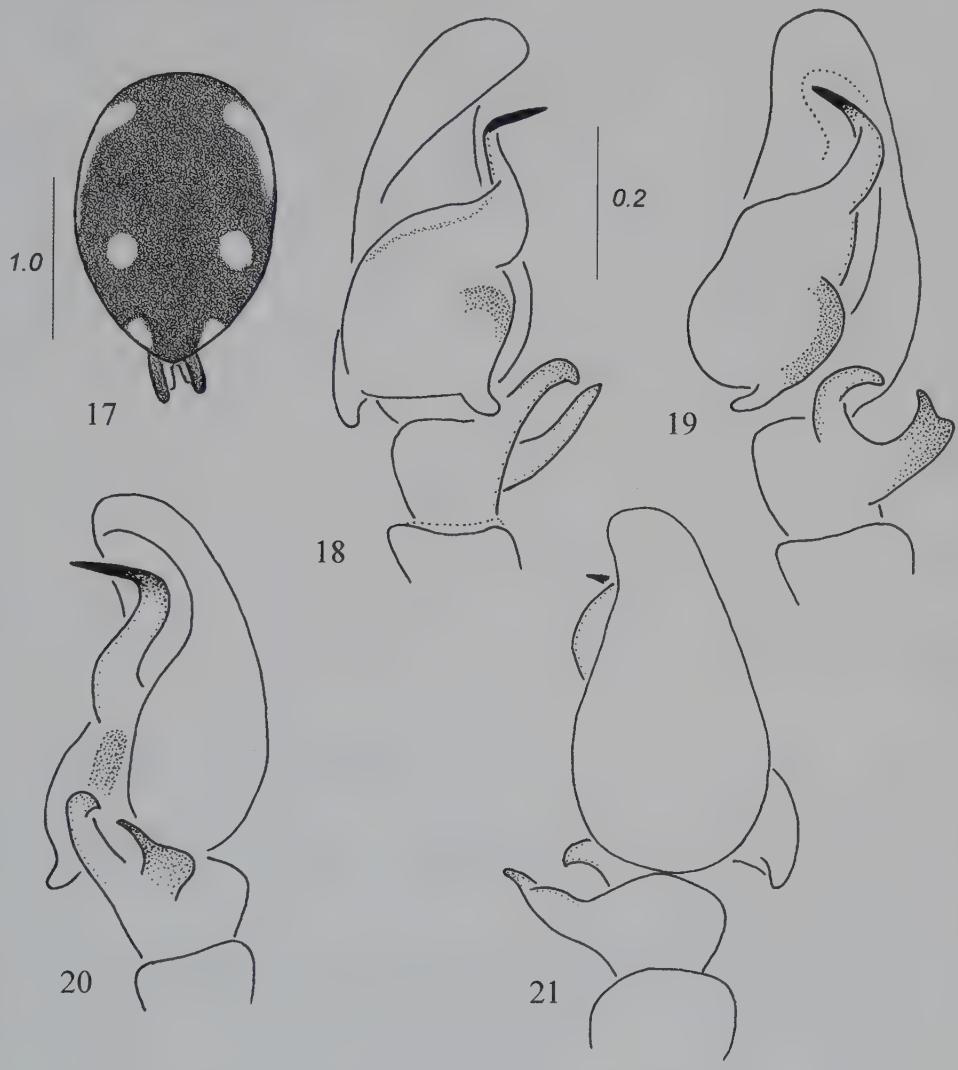
Female unknown.

Etymology: The specific epithet is Latin word meaning 'worth seeing', and refers to the size and shape of its tibial apophysis.

***Heliophanillus fulgens* (O. P.-Cambridge, 1872)**

Specimens examined: Al-Ain al-Fayda, 1♂, 8.iv.2005, HC. Al-Ajban, 2♀, 22.x–9.xi.2005, MT; 5♂, 2♀, 9.xi–7.xii.2005, MT & LT; 2♂, 7–28.xii.2005, MT; 4♂, 4♀, 28.xii.2005–29.i.2006, MT; 2♂, 26.ii–2.iv.2006, MT; 13♀, 27.v–26.vi.2006, MT; 1♂, 25.v–26.vi.2006, MT; 10♂, 9♀, 26.vi–25.vii.2006, MT; 2♂, 1♀, 20.vii–21.viii.2006, MT; 2♂, 2♀, 2–22.xi.2006, MT; 5♂, 1♀, 23.xi–27.xii.2006, MT. Bithnah, 1♀, 12.viii–9.ix.2006, MT; 1♂, 19.x–16.xi.2006, MT. SSW of ad-Dhaid, 3♂, 1♀, 29.xii.2005–7.i.2006, LT. Dubai, Mushrif Park, 1♀, 5 juv., 6.iii.2005, HC. Near al-Hayer, 3♂, 14.iii.2005, HC. Khor Kalba lagoon, 1♂, 12.iii.2005, HC. Khor al-Khawair, 1♂, 7–14.iv.2007, LT. Near Qurraya, 2♂, 16.iii.2005, HC on *Tamarix* tree. S of Ras al-Khaimah, 3♂, 2♀, 1 juv., 8.iii.2008, HC; 1♂, 24–29.vi.2008, WT. Sharjah Desert Park, 1♂, 3.iii.2005, HC; 3♀, 17.x–9.xi.2005, LT; 1♂, 6–28.xii.2006, PT. Sharjah-Ajman, 1♂, 1♀, 2.xii.2004, HC. Near Um al-Quwain, 1♂, 11–13.iii.2009, WT. Wadi Bih dam, 1♂, 24.iv–1.v.2007, LT; 1♂, 30.v–5.vi.2007, LT; 1♂, 9–23.vii.2008, LT. Wadi Maidaq, 1♂, 29.xi–22.xii.2005, LT; 5♂, 1♀, 1 juv., 21.xii.2005–2.ii.2006, LT; 1♀, 26.xii.2006–20.ii.2007, MT. Wadi Safad, 4♂, 26.xii.2005–2.i.2006, WT. Wadi Shawkha, 1♂, 31.x–27.xi.2006, WT; 3♂, 1–9.iv.2007, WT; 5♂, 2♀, 5–12.v.2007, WT; 3♂, 19–22.v.2007, WT; 1♂, 2♀, 9–24.vi.2007, WT; 5♂, 30.vi–2.viii.2007, WT; 1♂, 28.x–15.xi.2007, WT; 1♂, 3–18.ii.2008, WT; 1♀, 25.v–12.vi.2008, WT; 1♀, 11.viii–11.ix.2008, WT. Al-Wathba wetland reserve, 1♂, 23.viii.2004, HC; 1♂, 1♀, cocoon with 6 spiderlings, 6.ix.2004, WT.

Description: See Wesołowska & van Harten (1994).



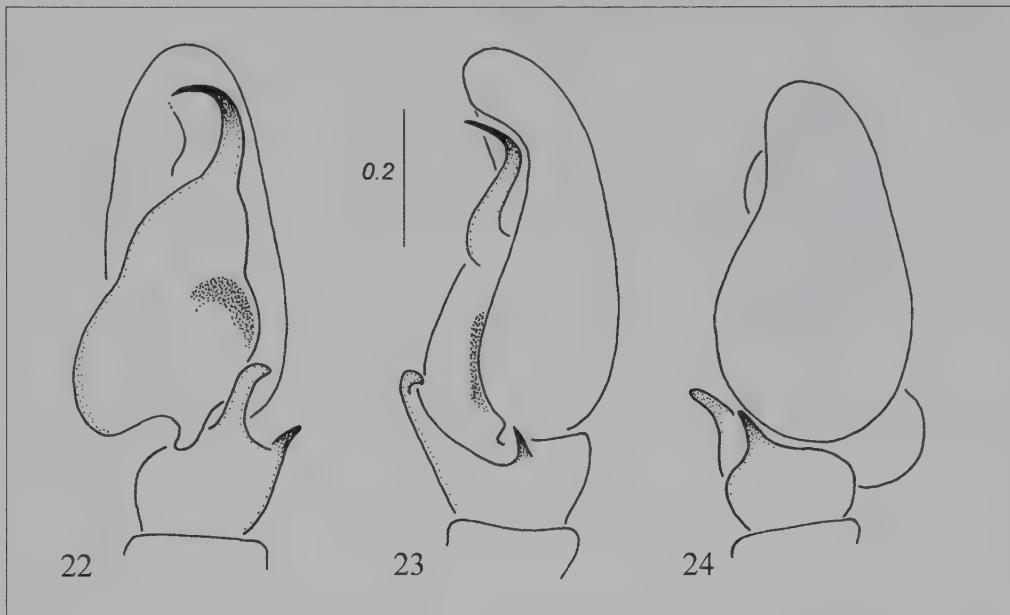
Figures 17–21. *Heliophanillus consciendus* nov. spec. 17: Abdominal pattern; 18: Palpal organ in ventral view; 19: Same in ventrolateral view; 20: Same in lateral view; 21: Same in dorsal view.

Distribution: Mediterranean species, reported from North Africa and the Near East. New to the UAE.

***Heliophanillus metallifer* Wesołowska & van Harten nov. spec.**

Specimens examined: holotype: ♂, United Arab Emirates, Khor Kalba lagoon, 24°59'N 56°21'E, 12.iii.2005, hand-collected, leg. A. van Harten (MRAC). Paratype: 1♂, Wadi Shawkah, 24.ii.2009, HC.

Figures 22–24



Figures 22–24. *Heliophanus metallifer* nov. spec. 22: Palpal organ in ventral view; 23: Same in lateral view; 24: Same in dorsal view.

Diagnosis: The species is closely related to *H. suedicola* (Simon, 1901). The male may be recognized by the longer strongly bent embolus and the shape of dorsal tibial apophysis, which is spike-like (bifurcate in *H. suedicola*).

Description: Measurements. Cephalothorax length 1.2–1.7, width 0.9–1.3, height 0.6. Abdomen length 1.3–1.9, width 0.9–1.3. Eye field length 0.6–0.8, anterior width 0.8–1.1, posterior width 0.9–1.1.

Male. Diminutive, dark coloured spider. Carapace oval, low, almost black with metallic shine. Colourless hairs cover carapace, white hairs form line along lateral edges and small patches behind posterior lateral eyes. Some dark bristles on eye field. Mouthparts brown, only chewing margins of gnathocoxae light, sternum light brown. Abdomen ovoid, black with three pairs of white spots, anterior pair extends to streak on abdominal sides. Shiny scales cover abdomen. Venter blackish. Spinnerets black. Legs orange, femur of first pair with brown lateral surfaces. Leg hairs and spines brown. Pedipalps dark brown. Palpal femur without apophyses, two apophyses on tibia, dorsal one short, spike-like (Figs 23, 24), tegulum irregular, embolus bent (Fig. 22).

Female unknown.

Etymology: The specific name refers to metallic shine of the body of this species.

Heliophanus abditus Wesołowska, 1986

Plate 7

Specimens examined: 5 km S of al-Jazirat al-Hamra, 4 juv., 9.x.2004, HC. 7 km S of al-Jazirat al-Hamra, 1♀, 16.xi.2004, HC; 1♀, 4.i.2005, HC. 15 km ESE of Sharjah, 1♀, 2.xii.2004, HC. Sharjah Desert Park, 1♂, 1 subad. ♀, 1 juv., 22.xi.2004, beaten from vegetation. Near Um al-Quwain, 1♀, 23–26.vi.2008, WT.

Description: See Wesołowska & van Harten (2007). General appearance of female as in Plate 7.

Distribution: Hitherto recorded in Near East (Syria?) and Yemen. New to the UAE.

***Langona pallida* Prószyński, 1993**

Plates 9–11, Figs 25–30

Specimens examined: N of Ajman, 1♂, 2♀, 16.ix–12.x.2006, WT; 1♂, 1–19.ix.2007, WT. Fujairah, 1♂, 2–30.i.2006, LT. Khor al-Khwair, 4♂, 7–14.iv.2007, LT; 1♂, 2–13.v.2007, LT. Near Mahafiz, 1♂, 21–28.iii.2006, LT. Sharjah Desert Park, 10♂, 3♀, 6–28.xii.2006, PT; 4♂, 2♀, 21.i–17.ii.2008, PT; 1♂, 4♀, 1–30.xi.2008, PT; 5♂, 2♀, 1–12.ii.2009, PT; 1♂, 1♀, 16.iii.2009, WT, leg. C. Schmid-Egger. Near Um al-Quwain, 1♂, 11–13.iii.2009, WT. Wadi Mайдж, 1♂, 9–11.iii.2009, WT. Wadi Shawkah, 1♀, 31.x–27.xi.2006, WT; 2♂, 20–26.iii.2007, WT; 19♂, 1♀, 1–9.iv.2007, WT; 11♂, 5–12.v.2007, WT; 22♂, 1♀, 9–24.vi.2007, WT; 75♂, 15♀, 30.vi–2.viii.2007, WT; 4♂, 1♀, 28.x–15.xi.2007, WT; 2♂, 1♀, 19–28.xi.2007, WT; 1♂, 20.i–18.ii.2008, WT; 15♂, 2♀, 21.i–17.ii.2008, PT; 2♂, 1♀, 3–18.ii.2008, WT; 23♂, 7♀, 11.viii–11.ix.2008, WT; 1♂, 24.ii.2009, HC. Al-Wathba wetland reserve, 1♂, 23.viii.2004, HC.

Description: Measurements (male/female). Cephalothorax length 2.7–3.4/3.2–4.0, width 2.1–2.2/2.3–2.5, height 1.0–1.1/1.3–1.5. Abdomen length 2.6–3.1/3.3–4.0, width 1.7–1.8/1.9–2.8. Eye field length 1.0–1.2/1.3–1.4, anterior and posterior width 1.5–1.6/1.8–2.2.

Male. Medium-sized, light coloured spiders, lighter than other *Langona* spp. (Plate 9). Eye field black, two light streaks of white hairs extend to thoracic part, anterior eyes encircled by whitish hairs. Thoracic region yellowish orange with two light streaks, between and laterally from them brown areas composed of dark hairs. Lateral surfaces of carapace yellow. Numerous light hairs on whole carapace. Clypeus with white hairs. Chelicerae orange, with large black spot on dorsal surfaces (Plate 10). Labium, gnathocoxae and sternum orange. Abdomen oval, light with two dark streaks composed of brown hairs, on anterior edge long bristles, venter whitish. Spinnerets yellow, covered with brown hairs. Legs yellow, first ones with black ventral surfaces of femora, patellae and tibiae, whole metatarsi and tarsi dark. Spines light, leg hairs brownish. Pedipalps yellow, cymbium flattened, its dorsal surface densely covered with black, metallic shining scales (Fig. 27), only tip of cymbium lighter. Tibial apophysis with hooked tip, tuft of long strong setae accompanies the apophysis (Fig. 26). Embolus long, spirally coiled on tip of bulb, hidden in cymbial pocket (Figs 25, 28).

Female. Larger than male. General appearance as in Plate 11. Carapace similar to that of male in general pattern, but poorly contrasted. Below anterior lateral eyes, on ‘face’ short whitish band. Abdomen uniformly light brown with sparse brown setae. Legs yellowish orange with brown small patches. Epigyne with deep oval depression, its posterior edge very strongly sclerotised (Fig. 29). Seminal ducts form loops, receptacles very strongly sclerotised, multi-chambered, last chamber spherical (Fig. 30).

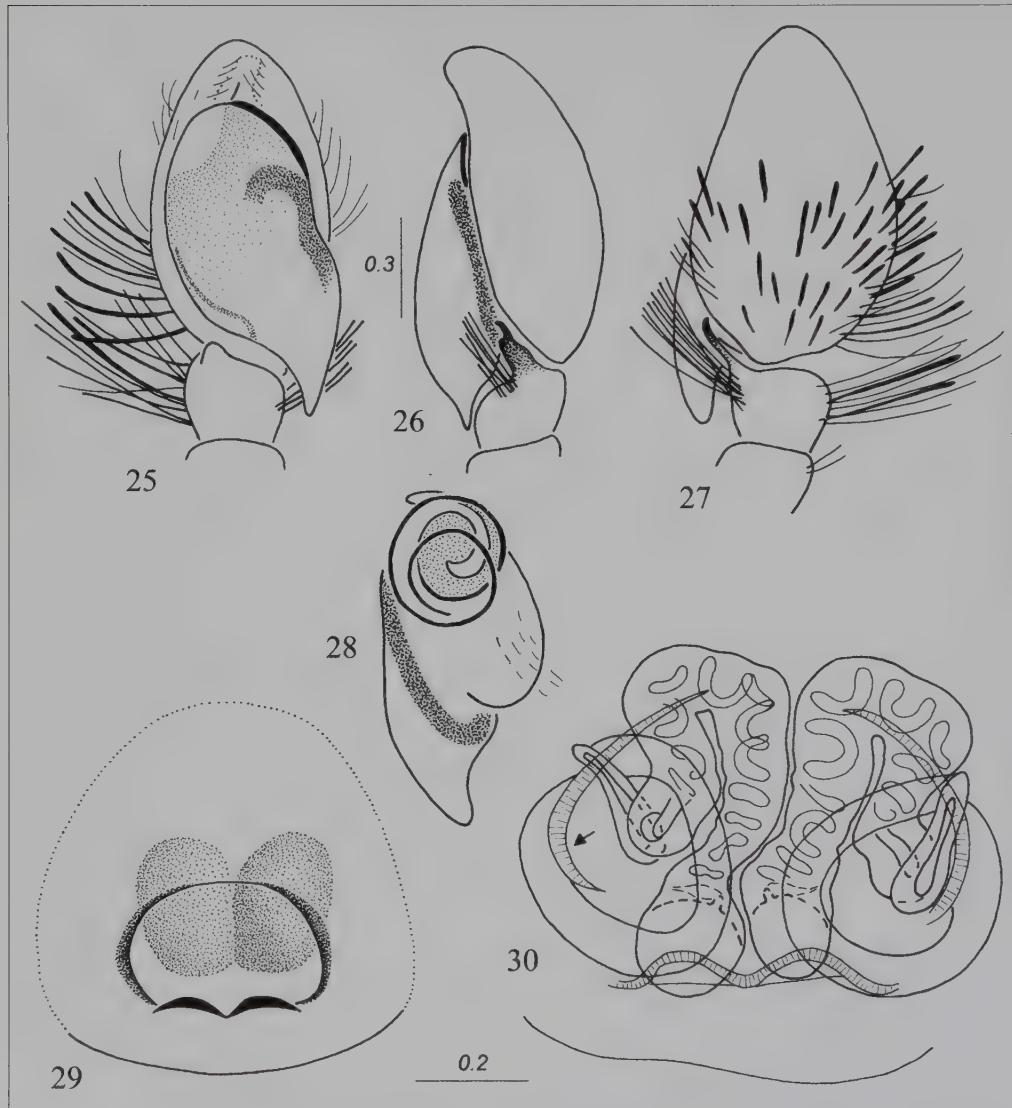
Distribution. So far known from Afghanistan and Saudi Arabia. New to the UAE.

***Menemerus affinis* Wesołowska & van Harten nov. spec.**

Figs 31–36

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Shawkah, 25°13'N 56°08'E, 25.v–12.vi.2008, in water trap, leg. A. van Harten (MRAC). Paratype: Dubai, Mushrif Park, 1♀, 6.iii.2005, HC.

Diagnosis: The species is closely related to *Menemerus arabicus* Prószyński, 1993, and *M. fagei* Berland & Millot, 1941, being similar to them in body size and colouration. The male differs from *M. fagei* by the lack of cymbial process (compare Figure 34 herein with Figure 124 in Wesołowska, 1999) and from *M. arabicus* by the shape of embolus (compare Figure 31 herein with Figure 17 in Prószyński, 1993), also the shape of apophyses in the three species is slightly different. The female has notch in posterior epigynal edge and the epigynal

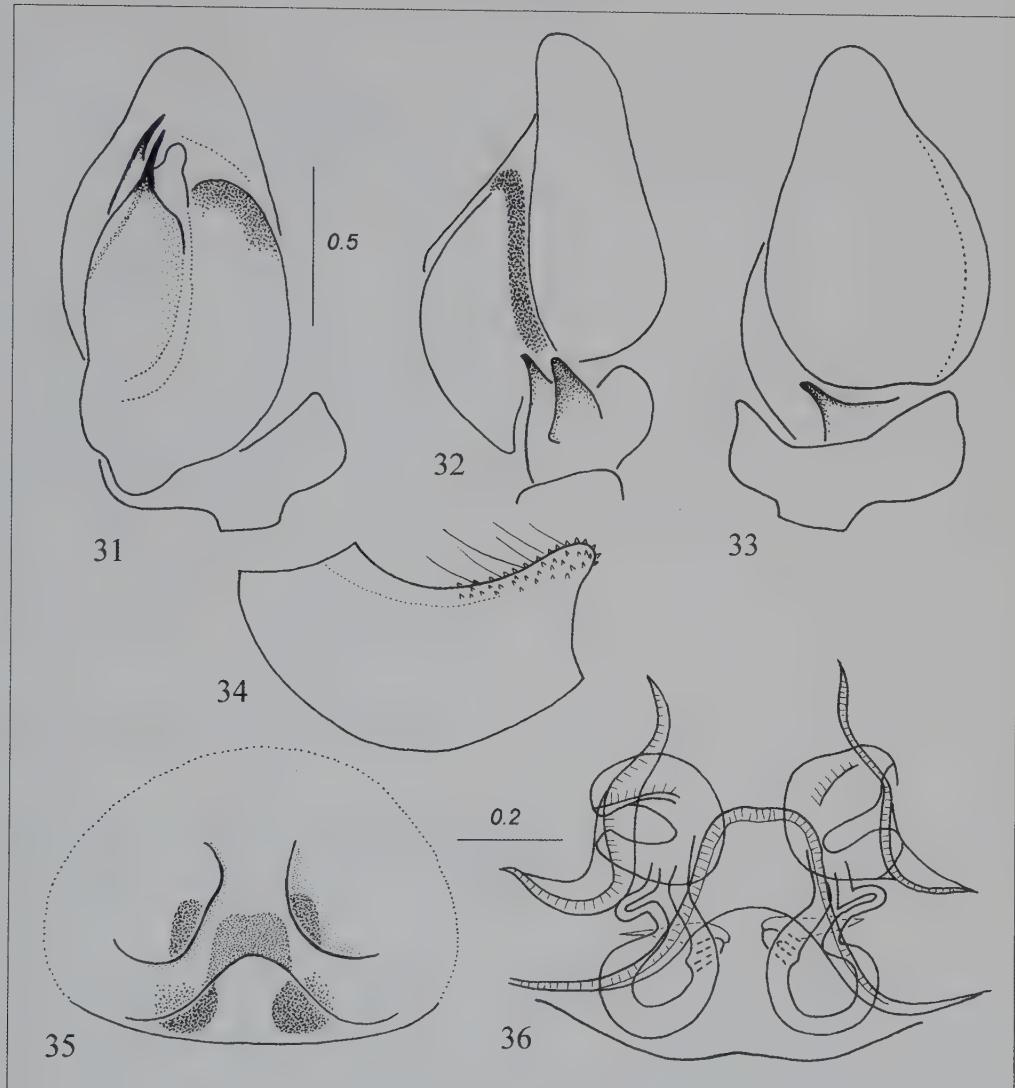


Figures 25–30. *Langona pallida* Prószyński. 25: Palpal organ in ventral view; 26: Same in lateral view; 27: Same in dorsal view; 28: Bulb in dorsal view (cymbium removed); 29: Epigyne; 30: Internal structure of epigyne.

pocket is clearly bigger than in *M. fagei* (compare Figure 36 herein with Figure 133 in Wesołowska, 1999).

Description: Measurements (male/female). Cephalothorax length 2.9/2.7, width 2.3/1.8, height 0.8/0.7. Abdomen length 3.1/4.0, width 2.0/2.4. Eye field length 1.3/1.0, anterior width 1.6/1.4, posterior width 1.6/1.5.

Male. Medium-sized spider. Carapace flattened, brown with darker eye field. White hairs cover ocular area and form median band on thoracic part. Thin white lines along lateral



Figures 31–36. *Menemerus affinis* nov. spec. 31: Palpal organ in ventral view; 32: Same in lateral view; 33: Same in dorsal view; 34: Palpal femur; 35: Epigyne; 36: Internal structure of epigyne.

margins of carapace. Clypeus brown. Mouthparts and sternum brown. Abdomen greyish brown with light median leaf-shaped belt, anteriorly divided by dark longitudinal patch. Sides and venter light. Dense long brown and greyish hairs cover abdomen. Spinnerets light grey. Legs I and II brown, posterior pairs lighter. Leg hairs dense, brown; white hairs only on apical part of first femora and basal part of patellae. Pedipalp brown, its femur dorsally with dense white hairs. Stridulatory apparatus present, composed of some bristles placed on small tubercles at base of femur ventrally (Fig. 34); the 'grater' is placed on retrolateral surface of chelicerae. Structure of palpal organ shown in Figures 31–34. Tegulum oval, with distinct furrow separating distal haematodocha, embolus with accompanying large conductor, the

same shape as in *M. sagei* (Fig. 31), the conductor with narrow sclerotised keel. Tibial apophyses as in Figures 32, 33.

Female. Similar to male, but along lateral margins of carapace wide white streaks. Epigyne wide, with deep notch in posterior margin and large pocket (Fig. 35). Laterally two depressions. Internal structure as in Figure 36, typical for the genus, with copulatory openings hidden in large, strongly sclerotised ‘cups’, short seminal ducts and spherical receptacles.

Etymology: The specific name refers to the relationship of the species to congeners.

Mogrus cognatus Wesołowska & van Harten, 1994

Figures 37–39

Specimens examined: Khor al-Khwair, 1♂, 2–13.v.2007, LT.

Description: Measurements. Cephalothorax length 2.8, width 2.2, height 1.2. Abdomen length 3.1, width 1.8. Eye field length 1.2, anterior width 1.9, posterior width 2.0.

Male. Cephalothorax high, gently sloping posteriorly. Carapace dark brown, eye field black, near eyes long brown bristles. Sides of carapace covered by dense white hairs. Two white streaks on thoracic part. Clypeus clothed in dense, long, white hairs. Chelicerae almost black, labium and gnathocoxae brown with paler tips, sternum yellow. Abdomen thin, elongated, pointed at the end, dark brown with two whitish streaks form by light hairs. Venter dark yellow with brownish longitudinal stripe. Spinnerets light brown. Legs dark yellow, only distal ends of femora brownish, on patellae and tibiae darker spots. Leg hairs and spines brownish. Pedipalps dark. Palpal organ typical for the genus. Cymbium narrow, tibial apophysis long with very thin end (Fig. 39), tegulum small, rounded with large additional anterior protuberance, embolus long with broad ‘pars pendula’ (Fig. 37).

Female unknown.

Distribution: Hitherto this species was only known from Yemen. New to the UAE.

Mogrus logunovi Prószyński, 2000

Specimens examined: 7 km S of al-Jazirat al-Hamra, 1♂, 1♀, 16.xi.2004, HC; 2♂, 4.i.2005, HC. Sharjah, 1♂, 22.xii.2004, HC. Sharjah Desert Park, 1♂, 1♀, 1–12.ii.2009, PT.

Description: See Wesołowska & van Harten (2007).

Distribution: So far this species was known from Palestine, Jordan and Yemen. New to the UAE.

Myrmarachne tristis (Simon, 1882)

Specimens examined: Dubai, Mushrif Park, 3♂, 1♀, 5 juv., 6.iii.2005, HC. Sharjah Desert Park, 1 juv., 21.xii.2007–23.i.2008, LT.

Description: See Wanless (1978).

Distribution: Species known from North Africa and the Arabian Peninsula (Wanless, 1978), very common in the whole Yemen. New to the UAE.

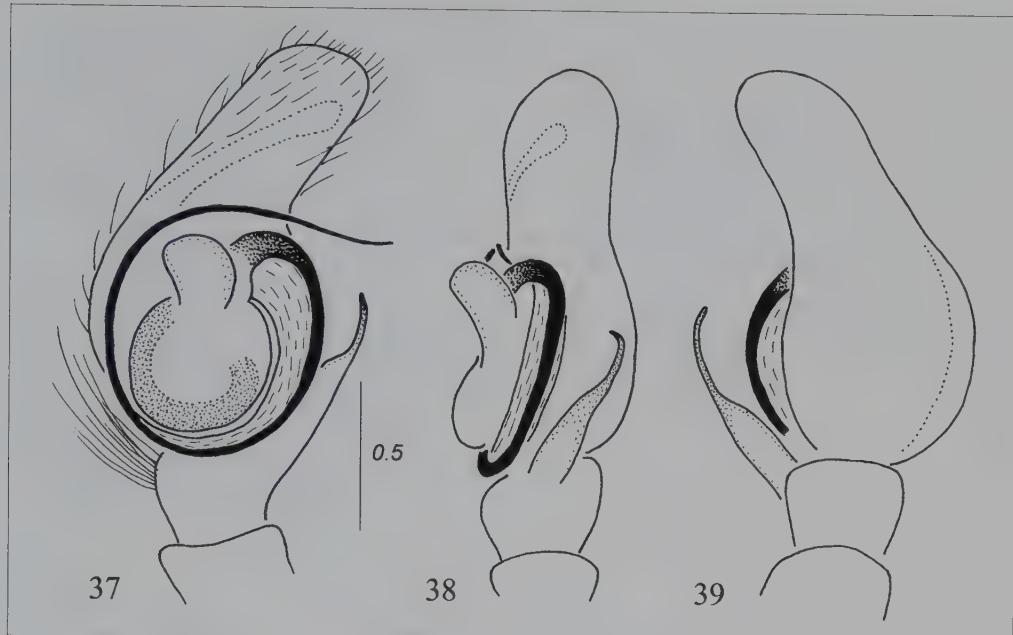
Neaetha oculata (O. P.-Cambridge, 1876)

Plate 8, Figures 40–43

Synonym: *Neaetha murphyorum* Prószyński, 2000 nov. syn.

Specimens examined: N of Ajman, 2♀, 16.ix–12.x.2006, WT; 1♀, 25.vi–5.vii.2008, WT; 1♂, 5–16.vii.2008, WT; 2♂, 2♀, 16–23.vii.2008, WT; 1♀, 1–14.ii.2009, WT; 3♀, 15–16.iii.2009, WT, leg. C. Schmid-Egger. 7 km S of al-Jazirat al-Hamra, 1♂, 16.xi.2004, HC; 1♂, 4.i.2005, HC. Khor al-Khwair, 1♂, 1♀, LT. Near Qurraya, 1♂, 5–30.xi.2008, WT. Al-Rafah, 1♀, 1–12.ii.2009, WT. S of Ra’s al-Kaimah, 1♀, 18–22.v.2008, WT; same locality, 1♀, 18–28.vi.2008, WT.

Synonymisation: The type of *N. murphyorum* not examined, but analysis of the original description and figures does not reveal any differences between this species and *N. oculata*; therefore these specific names are considered synonyms.



Figures 37–39. *Mogrus cognatus* Wesołowska & van Harten. 37: Palpal organ in ventral view; 38: Same in lateral view; 39: Same in dorsal view.

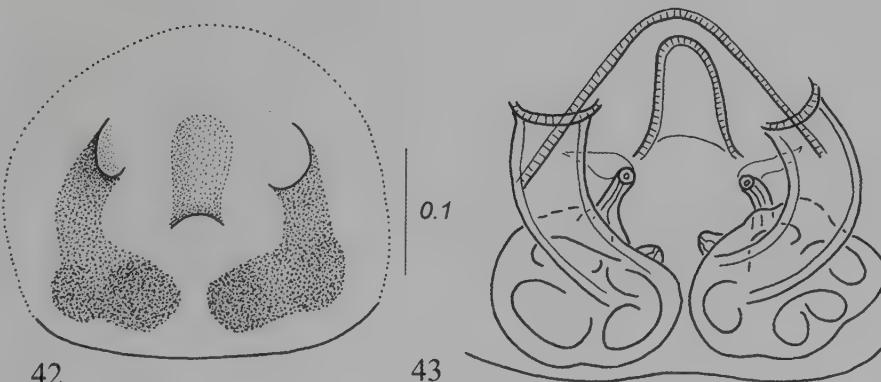
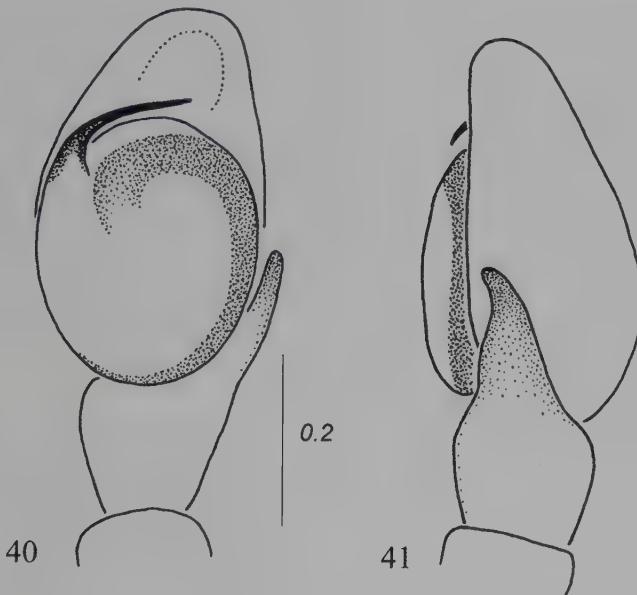
Description: Measurements (male/female). Cephalothorax length 1.6–1.7/1.6–1.9, width 1.4–1.5/1.6–1.8, height 0.7–0.8/0.7–0.8. Abdomen length 1.5–1.6/1.9–2.2, width 0.9–1.1/1.3–1.5. Eye field length 0.8–0.9/0.9–1.0, anterior width 1.1–1.2/1.2–1.4, posterior width 1.3–1.4/1.5–1.7.

Male. Carapace rhomboid (Plate 8), widest at level of posterior eyes, high in cephalic part and sloping abruptly posteriorly. Anterior median eyes relatively large, their diameter over twice as large as diameter of anterior lateral eyes. Eye field occupies about half of carapace. Carapace reddish brown, clothed in grey hairs, margins of carapace with thin dark line, eyes surrounded by black, anterior eyes fringed by fawn scales. White hairs form transverse line on eye field along bases of anterior eyes and two lines along lateral margins of ocular area. Traces of two darker patches in centre of eye field. Clypeus high, covered with dense white hairs. Chelicerae small, blackish with sparse white scales, mouthparts dark brown, sternum yellow. Abdomen narrower than carapace, oval, yellow with brownish grey pattern composed of longitudinal median dark streak on anterior part and lighter patch at lateral edges. Dorsum covered with grey hairs, among them some brown bristles. Venter light (in one specimen intensively orange). Spinnerets brownish grey. First pair of legs robust, femur reddish brown, patella, tibia and metatarsus black, long flattened black hairs on these segments. Legs II–IV yellow with brownish rings, femora III distinctly longer than in other pairs. Pedipalps small, dark yellow, only femora darker. Tibial apophysis simple, wide at base (Fig. 41), bulb oval, embolus thin (Fig. 40).

Female. Body shape as in male, colouration similar but lighter, legs uniformly dark yellow, black setae on first legs absent. Epigyne with central pocket (Fig. 42), internal structure as in Figure 43, receptacles strongly sclerotised.



Plates 5–8. 5: *Evarcha seyun* Wesołowska & van Harten, male; 6: *Evarcha seyun* Wesołowska & van Harten, female; 7: *Heliophanus abditus* Wesołowska, female; 8: *Neaetha oculata* (O. P.-Cambridge), male.



Figures 40–43. *Neaetha oculata* (O. P.-Cambridge). 40: Palpal organ in ventral view; 41: Same in lateral view; 42: Epigyne; 43: Internal structure of epigyne.

Distribution: Hitherto this species was known from Egypt, Saudi Arabia, Yemen and Israel. New to the UAE.

***Pellenes geniculatus* (Simon, 1868)**

Plates 13–16, Figures 44–51

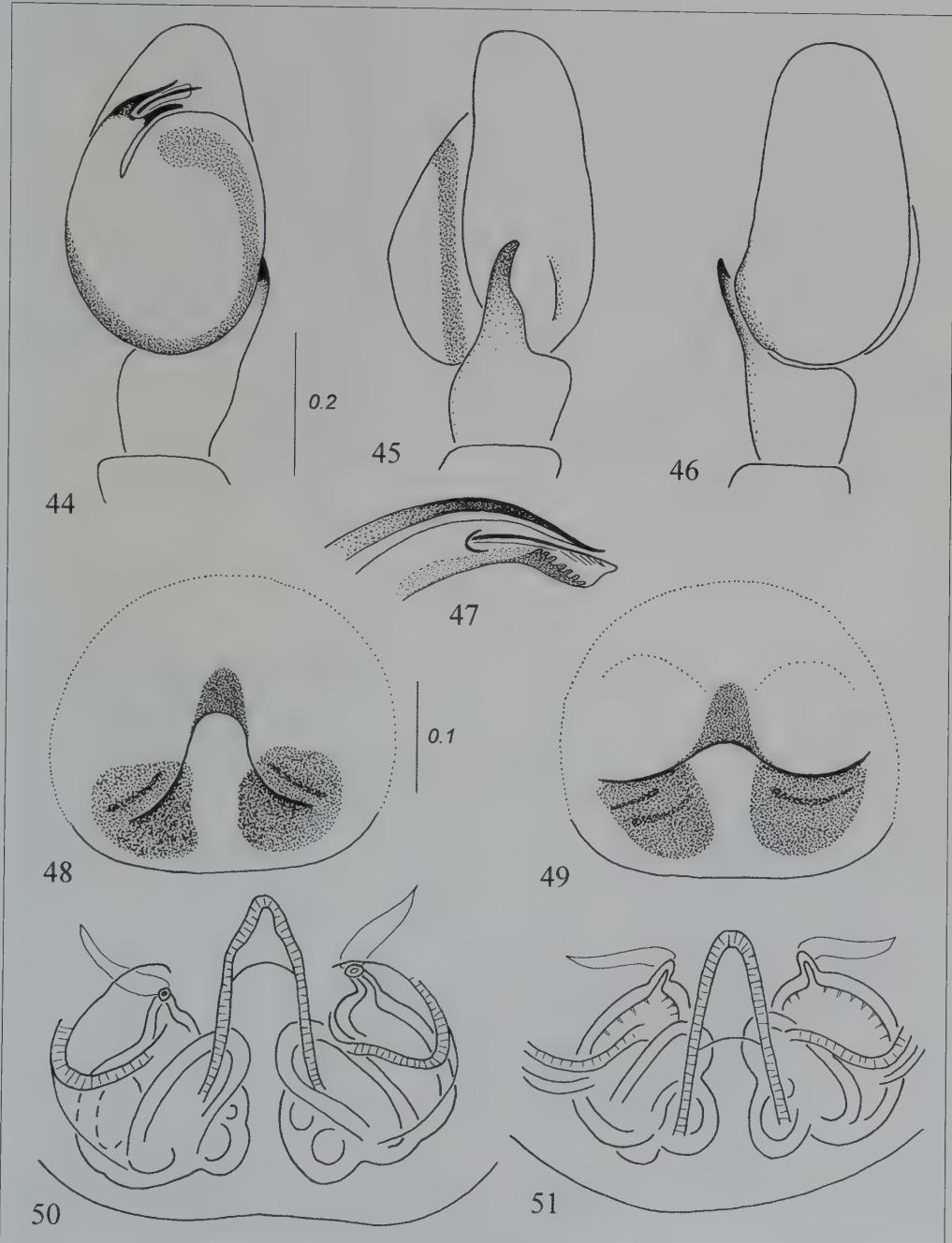
Specimens examined: 7 km S of al-Jazirat al-Hamra, 1♀, 1.xii.2004, WT; 1♀, 22.xii.2004, WT. Near Mahafiz, 1♂, 21–28.iii.2006, LT. S of Ra's al-Khaimah, 1♂, 25–26.iii.2008, WT, leg. J. Bosák. Sharjah Desert Park, 1♂, 3♀, 3 juv., 5–6.x.2004, HC; 1♀, 4–8.12.2004, WT; 1♂, 1♀, 1 juv., 6–28.xii.2006, PT; 1♂, 1–30.xi.2008, PT; 1♀, 1–12.ii.2009, PT; 1♂, 16.iii.2009, WT, leg. C. Schmid-Egger. Near Um al-Quwain, 2♂, 23–26.vi.2008, WT. Wadi Maidaq, 1♂, 14–25.i.2006, WT; 2♂, 4♀, 29.iii–10.iv.2006, WT; 2♂, 18.xi–15.xii.2007, PT. Wadi Safad, 1♂, 26.xii.2005–2.i.2006, WT. Wadi Shawkah, 2♂, 3♀,



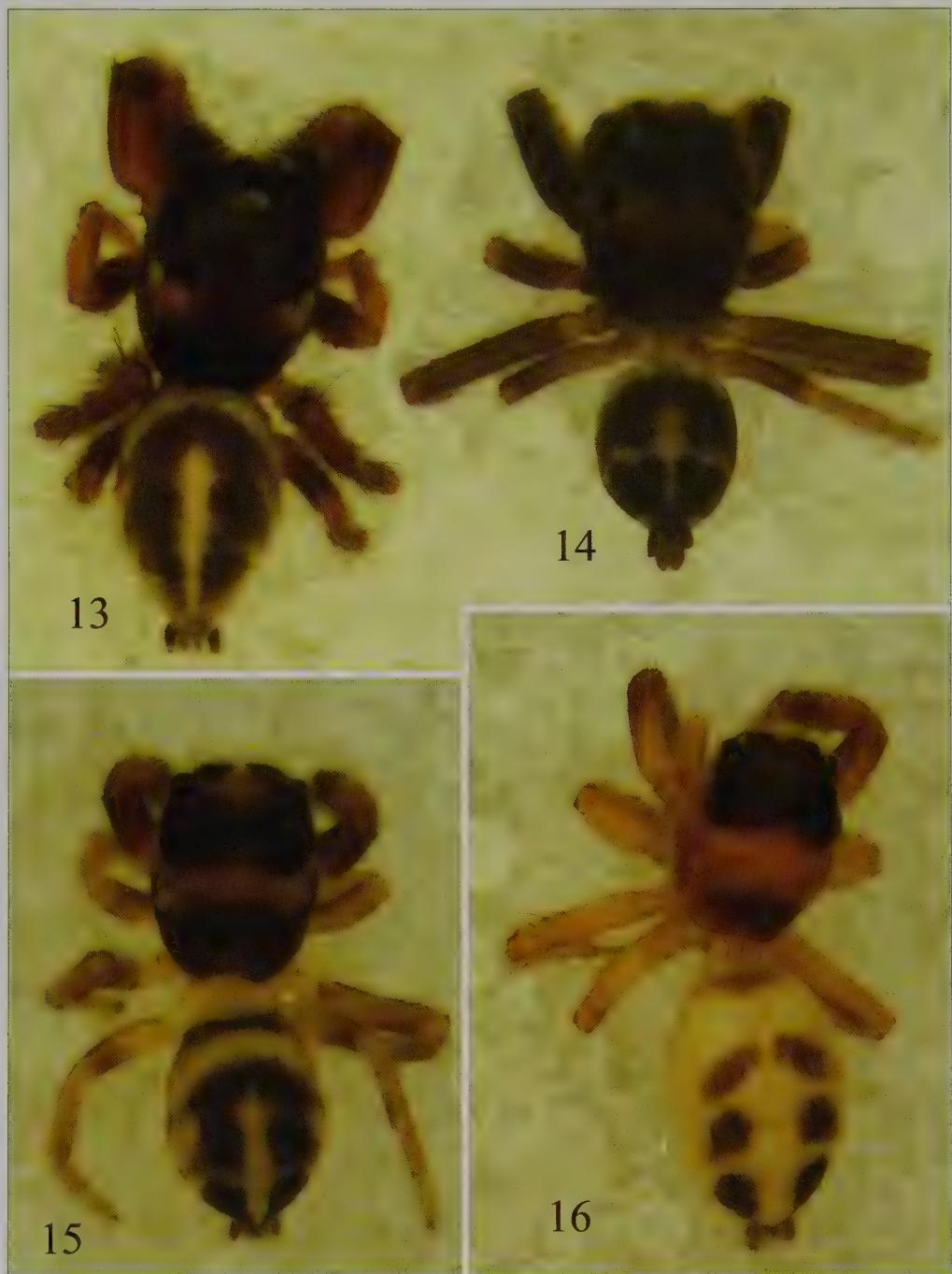
Plates 9–12. 9: *Langona pallida* Prószyński, male; 10: *Langona pallida* Prószyński, male, frontal view; 11: *Langona pallida* Prószyński, female; 12: *Yllenus logunovi* nov. spec., male, lateral view.

31.x–27.xi.2006, WT; 7♂, 5♀, 5–12.v.2007, WT; 2♂, 1♀, 19–22.v.2007, WT; 5♂, 3♀, 9–24.vi.2007, WT; 7♂, 6♀, 1 juv., 30.vi–2.viii.2007, WT; 1♂, 28.x–15.xi.2007, WT; 3♂, 2♀, 19–28.xi.2007, WT; 2♀, 20.i–18.ii.2008, WT; 3♂, 25.v–12.vi.2008, WT; 3♂, 1♀, 11.viii–11.ix.2008, WT. Wadi Wurayah, 1♂, 16–28.i.2009, WT. Al-Wathba wetland reserve, 2♀, 4 juv., 23.viii.2004, HC.

Description. Measurements (male/female). Cephalothorax length 1.2–1.9/1.6–1.8, width 1.0–1.4/1.2–1.4, height 0.5–0.8/0.7–0.8. Abdomen length 1.1–1.8/1.9–2.1, width 0.9–1.2/1.3–1.6. Eye field length 0.6–0.9/0.8–0.9, anterior width 0.7–1.1/0.9–1.1, posterior width 0.8–1.3/1.0–1.3.



Figures 44–51. *Pellenes geniculatus* (Simon). 44: Palpal organ in ventral view; 45: Same in lateral view; 46: Same in dorsal view; 47: Embolus; 48, 49: Epigynes; 50, 51: Internal structure of epigynes.



Plates 13–16. *Pellenes geniculatus* (Simon). 13–14: Males; 15–16: Females.

Male. Diminutive spider, considerable variability in body size and colouration (Plates 13, 14). Carapace high, oval, brown with black eye field. Long brown setae in vicinity of eyes, white scales cover anterior half of ocular area, in some specimens white area reduced to small patch in centre of eye field. Thorax with large crescent white spot, sometimes divided medially. Anterior median eyes surrounded by yellowish scales. Clypeus brown with white line. Chelicerae brown, with vertical lines composed of white scales. Mouthparts and sternum yellow to brown. Abdomen brown with white anterior margin and irregular median belt, marginally two pairs of diagonal light spots (but pattern variable – Plates 13, 14). Sides and venter light. Abdomen clothed in dense clinging light hairs, among them sparse brown bristles. Spinnerets dark. First pair of legs slightly larger than remaining, brown with blackish long scales on tarsi. Legs II–IV yellow to light brown. Pedipalp brown, only tip of cymbium whitish. White scales cover distal part of palpal femur and tibia. Palpal structure as in Figures 44–46. Tibial apophysis long, lying in shallow cymbial groove (Fig. 45). Embolus with large accompanying apophysis (Fig. 47).

Female. Colouration similar to male, less white hairs on ocular area, usually only small light spot in centre of eye field. Abdominal pattern variable (Plates 15, 16), in some specimens lighter, sometimes composed of three pairs of dark spots.

Dark scales on first leg absent. Epigyne typical for the genus, with central pocket (Figs 48, 49). Internal structure as in Figures 50 and 51.

Distribution. Species widely distributed in southern Palaearctic. New to the UAE.

***Pellenes hedjazensis* Prószyński, 1993**

Plate 17, Figures 52–56

Specimens examined: N of Ajman, 2♂, 1♀, 25.v–12.vi.2008, WT; 7♂, 1♀, 25.vi–5.vii.2008, WT; 3♂, 5–16.vii.2008, WT; 2♂, 3♀, 16–23.vii.2008, WT; 3♂, 4♀, 23–30.vii.2008, WT; 1♂, 22.ix–17.x.2008, WT. Wadi Siji, 1♀, 24.ix–12.x.2006, WT.

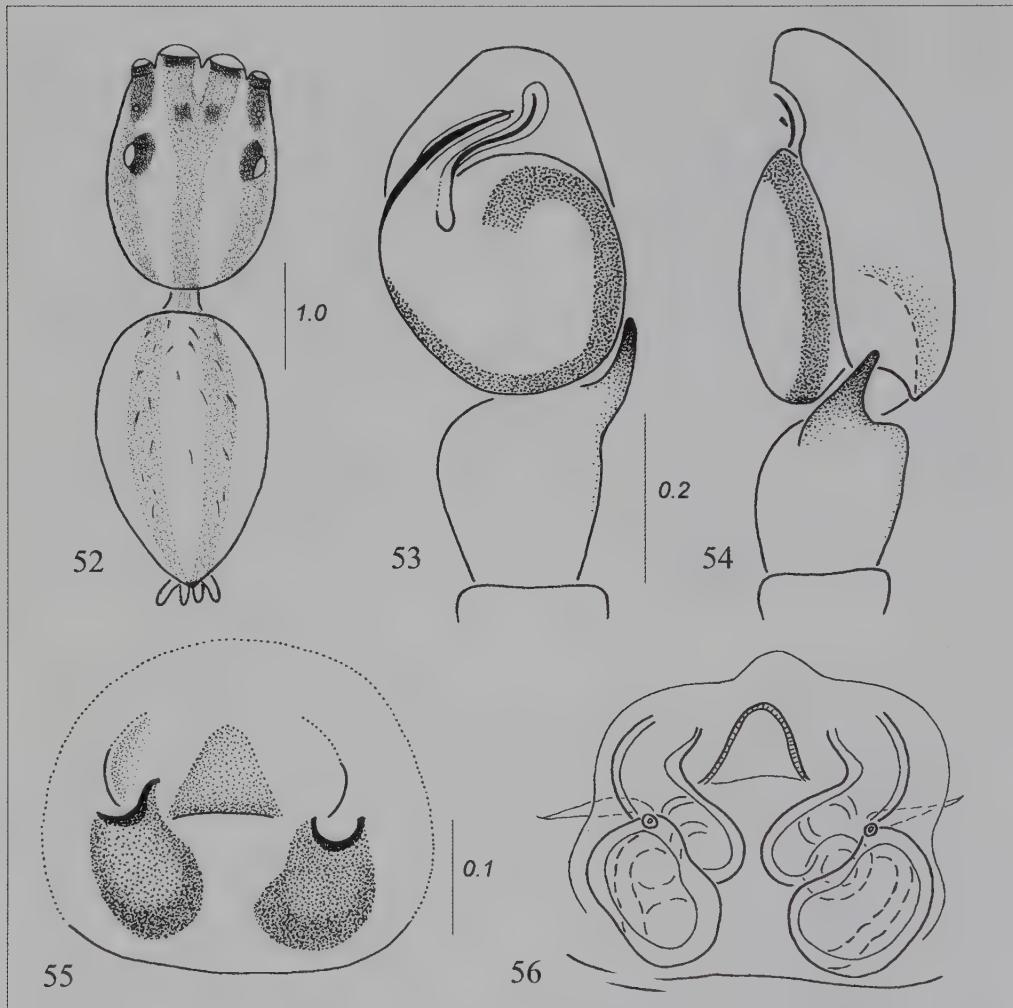
Description: Measurements (male/female). Cephalothorax length 1.5–2.0/1.6–1.7, width 1.2–1.5/1.2–1.3, height 0.7–0.9/0.7–0.8. Abdomen length 1.9–2.6/1.8–2.6, width 1.3–1.4/1.3–1.8. Eye field length 0.8–1.0/0.7–0.8, anterior width 1.0–1.1/0.9–1.0, posterior width 1.1–1.2/1.0–1.1.

Male. General appearance as in Plate 17 and Figure 52. Small, light coloured spider. Carapace oval, eye field occupying about half of its length. Carapace striped, three longitudinal white streaks on light orange background, lateral stripes starting between lateral and median eyes run to posterior edge of carapace, median streak extends only to centre of ocular area (Fig. 52). Lateral sides of cephalothorax clothed in white hairs. Clypeus covered with dense white hairs but bases of chelicerae black. Mouthparts white yellowish, sternum yellow. Abdomen oval, whitish yellow with two longitudinal orange stripes (Fig. 52). Some white hairs on abdomen, among them sparse brown bristles. Venter light, almost white. Spinnerets yellowish. Legs yellow with white scales, spines light, only on first legs brown. Sparse black flattened long setae on ventral surface of first tibia. Pedipalps light, only bulb brownish. Cymbium with retrolateral shallow depression. Tibial apophysis short (Fig. 54), embolus needle shaped, compound terminal apophysis large (Fig. 53).

Female. Shape, size and colouration as in male, first tibia without black setae. Epigyne typical for members of the genus, with central pocket (Fig. 55). Internal structures as in Figure 56.

Remarks: The first description of the female is given here.

Distribution: Hitherto known only from Saudi Arabia. New to the UAE.



Figures 52–56. *Pellenes hedjazensis* Prószyński. 52: General appearance; 53: Palpal organ in ventral view; 54: Same in lateral view; 55: Epigyne; 56: Internal structure of epigyne.

Phlegra bresnieri (Lucas, 1846)

Specimens examined: Near al-Hayer, 1♂, 14.i.2005, HC. 7 km S of al-Jazirat al-Hamra, 1♂, 4.i.2005, HC. Sharjah Desert Park, 1♂, 1♀, 5–6.x.2004, HC; 1♀, 3.iii.2005, HC; 2♂, 6–28.xii.2006, PT. Wadi Shawkah, 1♂, 28.x–15.xi.2007, WT.

Description: See Logunov (1996).

Remarks: Colouration variable, light with striped pattern to dark without stripes but with abdominal scutum. Differently coloured specimens occur at the same site.

Distribution: Widely distributed in Europe and northern Africa; known also from Yemen. New to the UAE.

Phlegra pusilla Wesołowska & van Harten, 1994

Specimens examined: Wadi Bih dam, 1♂, 19–25.ii.2009, MT.

Description: See Wesołowska & Tomasiewicz (2008). General appearance of the male as in Plate 18. Visible characteristic red hairs cover eye field.

Remarks: This species was reported from Tanzania by Wesołowska & Russell-Smith (2000) as *Phlegra nuda* Próchniewicz & Heciak, 1994 (misidentified).

Distribution: Hitherto known from Ethiopia, Tanzania and Yemen. New to the UAE.

Plexippoides flavescens (O. P.-Cambridge, 1872)

Specimens examined: Khor al-Khwair, 1♂, 7–14.iv.2007, LT. Wadi Shawkah, 1♂, 30.vi–2.viii.2007, WT.

Description: See Wesołowska (1996).

Distribution: This species is known from the Near East, Yemen, Turkmenistan and Iran. New to the UAE.

Plexippus minor Wesołowska & van Harten nov. spec.

Plate 19, Figures 57–58

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Shawkah, 25°13'N 56°08'E, 1–9.iv.2007, in water trap, leg. A. van Harten (MRAC). Paratypes: 1♂, same data as holotype. 1♂, same locality but 5–12.v.2007, WT; 2♂, same locality but 11.viii–11.ix.2008, WT; 1♂, same locality but 19–28.xi.2007, WT.

Diagnosis: The male may be distinguished from congeners by the short tibial apophysis and short embolus.

Description: Measurements. Cephalothorax length 3.1–3.3, width 2.3–2.5, height 1.3. Abdomen length 3.3–3.4, width 2.0. Eye field length 1.3–1.4, anterior width 2.0–2.1, posterior width 1.9–2.0.

Male. General appearance as in Plate 19. Carapace orange with two large light brown spots divided by light area on thoracic part, black line along margins of carapace. Eye field almost black, covered with white hairs, the same hairs on slopes of carapace. Reddish hairs form patch between anterior median eyes and surround them, long brown bristles laterally on ocular area. Chelicerae dark brown, white hairs on their dorsal surface. Gnathocoxae and labium brown with yellowish tips. Sternum yellow. Abdomen ovoid, with three longitudinal stripes, lateral ones brown, median white but its anterior part reddish fawn, sides of abdomen light with brown dots, venter light, in dark specimens tinged with grey, with three dark streaks. Dense hairs cover abdomen, at anterior edge hairs denser and longer. Spinnerets light, their tips dark. First legs dark, almost black, but femur dorsally and patella prolaterally yellowish, white scales on femur. Second pair of legs slightly lighter, lateral surfaces of femur and dorsum of patella brown. Legs III and IV yellow, with brown patches on ventral surfaces of femora. Spines long, brown, leg hairs dark. Pedipalps generally light, yellowish; basal part of femur tinged with brown, retrolateral surface of femur apically with tuft of long light scale-like hairs. Dense white hairs cover lower part of cymbium. Tibial apophysis considerably shorter than other *Plexippus* species, light, only tip dark (Fig. 58). Embolus short, prolateral edge of bulb with strongly sclerotised serrate keel (Fig. 57).

Female unknown.

Etymology: The specific name refers to body size smaller than in *P. paykulli*, the second species of the genus occurring in the UAE.

Plexippus paykulli (Audouin, 1826)

Figures 59–60

Specimens examined: Al-Ajban, 2♀, 28.xii.2005–29.i.2006, MT; 1♂, 6–22.v.2006, LT. Bithnah, 1♂, 12.viii–9.ix.2006, MT; 2♀, 19.x–16.xi.2006, MT. Fujairah, 1♂, 2.v–5.vi.2005, LT; 1♀, 1 juv., 28.ii–1.iv.2006, LT; 1♂, 1–8.iv.2006, LT; 1♂, 20–27.v.2006, LT. Ghalilah, 1♀, 8.iii.2005, HC. Hatta, 1♀, 4–11.iv.2006, LT; 1♀, 11–26.iv.2006, LT. Khor al-Khwair, 1♀, 30.v–5.vi.2007, LT. Sharjah, 1♂, 30.xi.2004, HC; 1♀, 15.iii.2005, HC; 1♂, 17.iii.2005, HC, leg. F. van Harten; 1♂, 31.v.2007, HC, leg.

N. van Harten; 1♂, 12–26.vi.2005, LT. Sharjah Desert Park, 1♀, 6.x.2004, HC; 1♂, 28.v–4.vi.2007, LT; 1♂, 25.v–16.vi.2008, LT. Wadi Bih dam, 1♂, 24.iv–1.v.2007, LT; 1♀, 7–13.v.2007, LT; 1♂, 30.v–5.vi.2007, LT; 1♂, 17–25.iii.2008, LT; 1♂, 30.iv–4.vi.2008, LT; 1♂, 13–24.vi.2008, LT; 1♀, 9–23.vii.2008, LT; 1♂, 1♀, 25.ii–8.iii.2009, MT. Wadi Midaq, 1♀, 27.xi–22.xii.2005, LT.

Description: See Wesołowska & van Harten (1994). Palpal structure as shown in Figures 59 and 60 herein.

Distribution: A common pantropical species. New to the UAE.

***Pseudicius fayda* Wesołowska & van Harten nov. spec.**

Figures 61–63

Specimens examined: Holotype: ♀, United Arab Emirates, al-Ain al-Fayda, 24°05'N 55°40'E, 8.iv.2005, hand-collected, leg. A. van Harten (MRAC).

Diagnosis: The species is closely related to *Pseudicius tamaricis* Simon, 1885, but may be recognized by larger receptacles and seminal ducts having more loops (compare Figure 63 herein with Figure 617 in Prószyński, 2003).

Description: Measurements. Cephalothorax length 1.8, width 1.3, height 0.6. Abdomen length 2.9, width 1.4. Eye field length 0.8, anterior 0.9, posterior width 1.0.

Male unknown.

Female. Small-sized spider. Carapace oval, low, brown with darker eye field, clothed in dense light grey hairs, near eyes long brown bristles. Anterior eyes encircled with white setae, small white patches composed of hairs between anterior eyes. Clypeus low, brown with white hairs. Two diagonal light lines below posterior lateral eyes, on lateral surface of carapace. Chelicerae light brown, labium and gnathocoxae orange, sternum yellow. Stridulatory apparatus present, typical for the genus (of leg-carapace type). Abdomen elongated, greyish beige, darker at the end, with two pairs of light patches in posterior half and poorly contrasted lighter area in centre, anterior margin and sides whitish (Fig. 61). Dense light hairs on abdomen. Venter whitish with silver patches composed of translucent guanine crystals. Spinnerets grey. Legs yellow, first pair slightly thicker than remaining, on prolateral surface of tibia 0-0-1-1 spines, on metatarsus ventrally 2-2. Leg hairs brown. Epigyne with two long pockets in anterior part, placed close to each other (Fig. 62). Internal structure as shown in Figure 63, seminal ducts weakly sclerotised in initial part, long, composed a few loops, receptacles large.

Etymology: The specific name is a noun in apposition, referring to the type locality.

***Pseudicius mushrif* Wesołowska & van Harten nov. spec.**

Figures 64–66

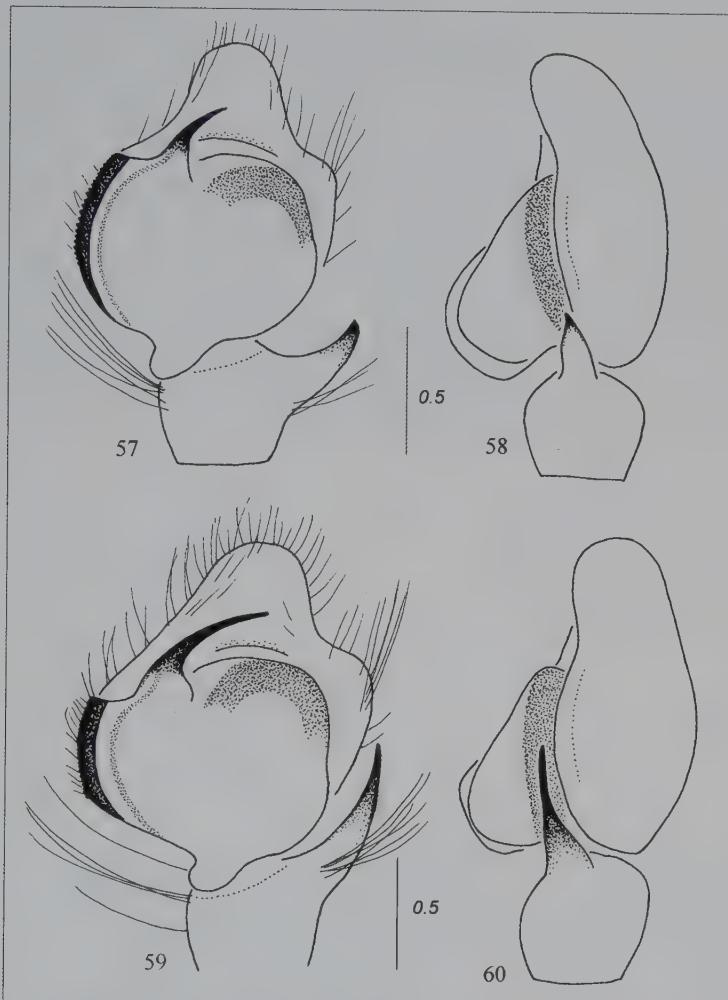
Specimens examined: Holotype: ♀, United Arab Emirates, Dubai, Mushrif Park, 25°17'N 55°28'E, 6.iii.2005, hand-collected, leg. A. van Harten (MRAC).

Diagnosis: The species is closely related to *Pseudicius wadis* Prószyński, 1989, differs in abdominal pattern and details of epigynal structure; epigyne is shorter and wider, with more distant pockets, seminal ducts are clearly shorter, accessory glands have different shape (compare Figure 66 herein with Figure 69 in Prószyński, 1989).

Description: Measurements. Cephalothorax length 2.0, width 1.5, height 0.6. Abdomen length 3.9, width 2.2. Eye field length 0.9, anterior 1.1, posterior width 1.2.

Male unknown.

Female. Carapace low, oval, reddish brown, black in vicinity of eyes, covered with delicate whitish hairs. Two diagonal light lines below posterior lateral eyes, on lateral surface of carapace. Chelicerae brown, clypeus with light hairs. Stridulatory apparatus present; a row of thick bristles on carapace under lateral eyes and a few small protuberances on femur of first leg apically on prolateral surface. Abdomen oval, greyish brown, darker posteriorly, with



Figures 57–60. 57–58: *Plexippus minor* nov. spec.; 59–60: *Plexippus paykulli* (Audouin). 57–59: Palpal organ in ventral view; 58–60: Same in lateral view.

poorly contrasted pattern composed of a few median lighter spots and two transverse whitish stripes in posterior part (Fig. 64). Delicate clinging hairs cover abdominal dorsum. Venter yellowish. Spinnerets light. First leg longer and thicker than remaining, orange, tibia slightly swollen, prolaterally with 0-1-1 short strong spines, metatarsus with two pairs ventrally. Legs II–IV yellow. Epigyne with two long pockets anteriorly, placed far from each other (Fig. 65). Internal structure as in Figure 66, accessory gland tubular, long.

Etymology: The specific name is a noun in apposition, referring to the type locality.

Rafalus arabicus Wesołowska & van Harten nov. spec.

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Maidaq, 25°18'N 56°07'E, 24. ix–22. x. 2006, in water trap, leg. A. van Harten (MRAC). Paratypes: 1♂, 7♀, same data as holotype; 1♀,

Plates 20–21, Figures 67–73



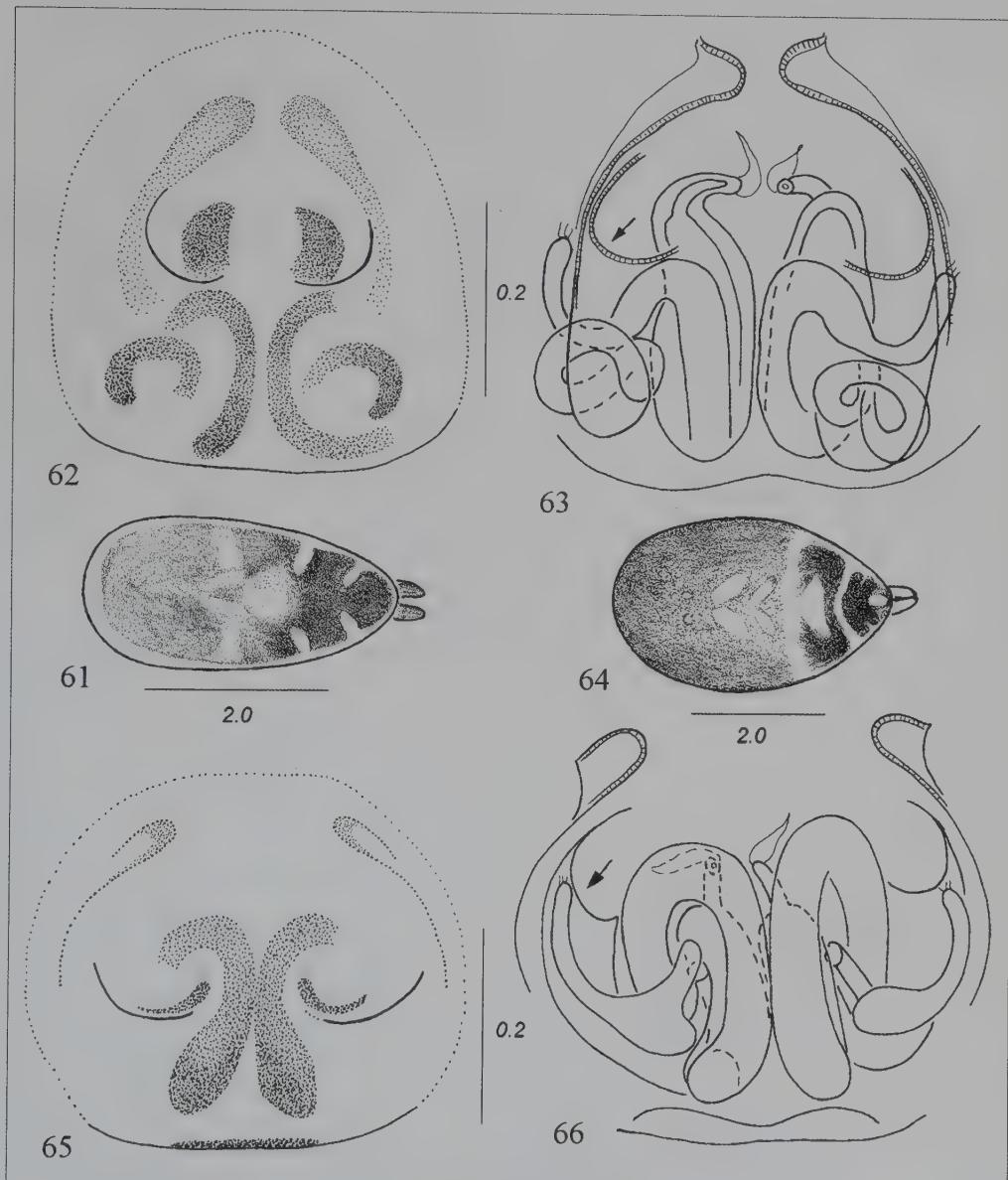
Plates 17–19. 17: *Pellenes hedjazensis* Prószyński, male; 18: *Phlegra pusilla* Wesołowska & van Harten, male; 19: *Plexippus minor* nov. spec., male.

same locality but 27.xi–22.xii.2005, LT; 1♂, 1♀, 28.xi–1.xii.2005, WT; 1♂, 1♀, 1 juv., 26.xii.2005–2.i.2006, WT; 1♂, 1♀, 4–15.i.2006, WT; 1♂, 1♀, 4–15.ii.2006, WT; 2♂, 3♀, 4–15.ii.2006, WT; 1♂, 2♀, 7–14.iii.2006, WT; 4♂, 2♀, 29.iii–10.iv.2006, WT; 3♀, 26.x–9.xi.2006, WT; 2♂, 4♀, 18.xi–15.xii.2007, PT; 1♀, 20.i–3.ii.2008, WT. 1♂, Khor al-Khwair, 7–14.iv.2007, LT. 1♀, Wadi Bih dam, 24.iv–1.v.2007, LT. 2♀, Wadi Safad, 27.xi–22.xii.2005, WT; 3♀, 26.xii.2005–2.i.2006, WT. 1♀, Wadi Shawkah, 1–9.iv.2007, WT; 4♂, 5–12.v.2007, WT; 2♂, 19–22.v.2007, WT; 4♂, 3♀, 9–24.vi.2007, WT; 2♂, 6♀, 30.vi–2.viii.2007, WT; 1♂, 28.x–15.xi.2007, WT; 3♂, 25.v–12.vi.2008, WT; 4♂, 11.viii–11.ix.2008, WT. 1♀, Wadi Wurayah, 22.iv.2006, WT; 1♂, 1♀, 10–26.xii.2006, WT; 1♂, 18–25.iii.2007, MT; 3♂, 7♀, 5–30.xi.2008, WT.

Diagnosis: The male is distinguished by thin, longer than in other congeners embolus, white hairs on retrolateral surface of palp and characteristic black and white hairs on ventral surface of femur of first leg. The female is easily recognisable by the structure of epigyne, unlike in other species of the genus, without deep pocket, with copulatory openings placed paracentrally and small, single-chambered receptacles.

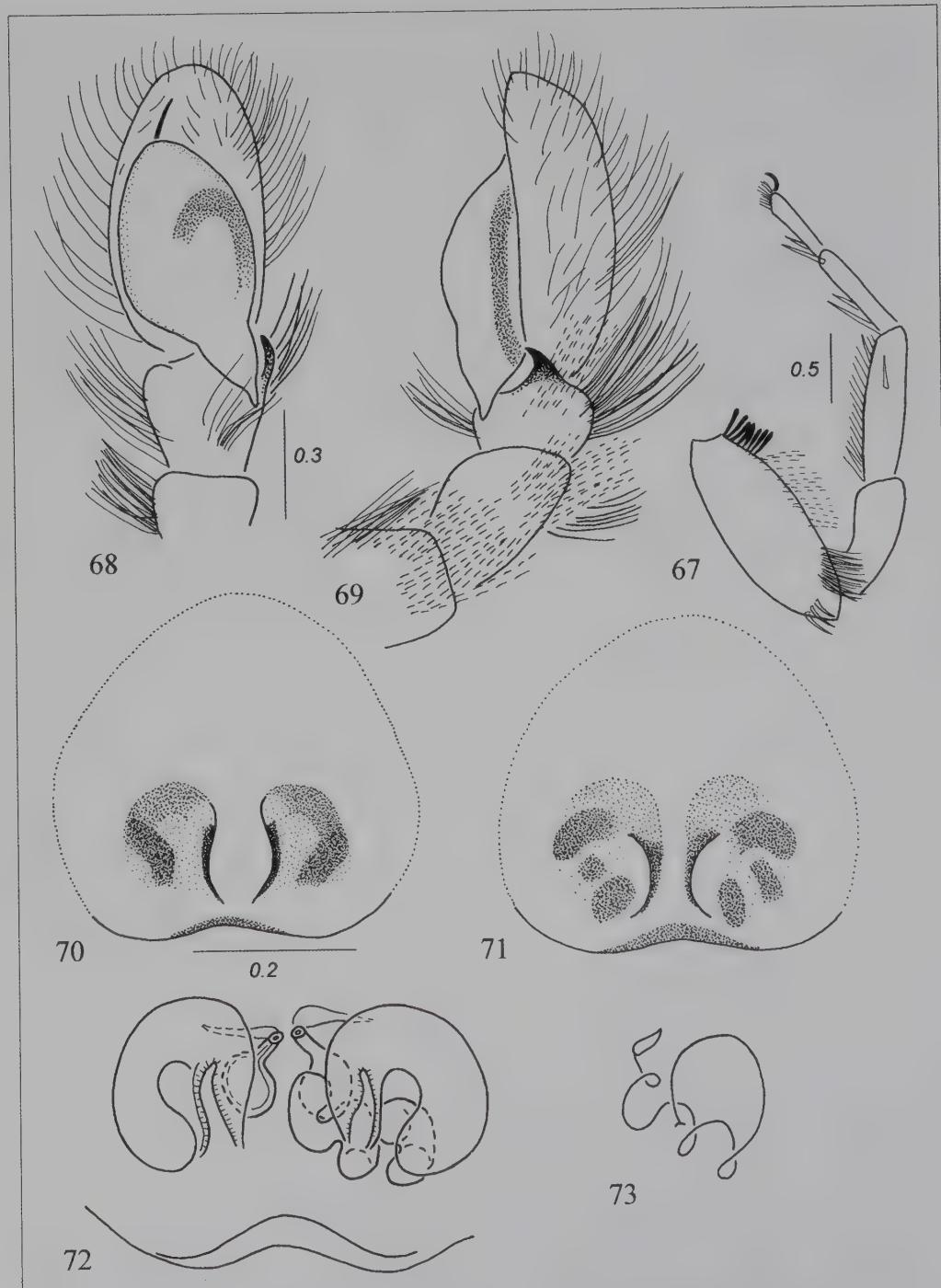
Description: Measurements (male/female). Cephalothorax length 2.8–3.0/3.0–3.4, width 2.1–2.2/2.1–2.4, height 1.1–1.3/1.5–1.6. Abdomen length 2.8–3.0/3.3–3.5, width 1.9/2.3–2.4. Eye field length 1.4/1.4–1.5, anterior 1.9/1.9–2.1, posterior width 1.8/1.7–1.9.

Male. Medium-sized, hairy spider (Plate 20). Carapace dark brown with eye field black, covered with dense, short, greyish hairs, on lateral sides hairs white, black line along lateral edges. Anterior part of ocular area with numerous long brown bristles. Anterior eyes fringed by fawn small scales. Clypeus low, yellowish brown. Chelicerae light brown, on promargin two small teeth, on retromargin single tooth. Labium and gnathocoxae brownish with pale tips, sternum brown. Abdomen greyish brown, with small scutum occupying about half of its length. Dorsum clothed in short whitish and long brown hairs. Sides and venter of abdomen light. Dark hairs cover sternum, coxae and abdomen ventrally. Spinnerets brown. Legs brown, covered with short light hairs, among them sparse longer brown ones. Spines numerous, brown. Femora I and II lighter, yellowish, with brown patches (covered with black



Figures 61–66. *Pseudicius fayda* nov. spec. (61–63) and *Plexippus mushrif* nov. spec. (64–66). 61, 64: Abdominal pattern; 62, 65: Epigyne; 63, 66: Internal structure of epigyne.

scale-like hairs) on ventral surfaces basally and tufts of dark hairs retrolaterally at distal end, long white hairs between the two dark areas (Fig. 67). Pedipalps slender, clothed in very dense hairs. Palpal hairs blackish, except retrolateral surface where hairs white (in figures white hairs marked broken lines). Tegulum elongated, with posterior triangular lobe, visible end of embolus thin (Fig. 68), tibial apophysis short (Fig. 69).



Figures 67–73. *Rafalus arabicus* nov. spec. 67: First leg; 68: Palpal organ in ventral view; 69: Same in lateral view; 70, 71: Epigynes; 72: Internal structure of epigyne; 73: Diagrammatic course of seminal duct.

Female. Similar to male, less hairy, on abdomen traces of lighter median streak (Plate 21), legs light brown with darker patches or rings. Epigyne small, weakly sclerotised, with central elevated ridge (Figs 70, 71). Copulatory openings fissure-like, seminal ducts form loose loops, receptacle small, spherical (Fig. 72).

Etymology: The species is named after its ‘terra typica’ (the Arabian Peninsula).

***Rafalus desertus* Wesołowska & van Harten nov. spec.**

Plate 22, Figures 74–75

Specimens examined: Holotype: ♂, United Arab Emirates, N of Ajman, 25°26'N 55°29'E, 25.vi–5.vii.2008, in water trap, leg. A. van Harten (MRAC). Paratypes: 2♂, same locality but 21–25.x.2007, WT; 1♂, same locality but 5–16.vii.2008, WT. 1♂, SSW of ad-Dhaid, 27.xi–1.xii.2005, PT.

Diagnosis: The male of the species is easily distinguished from other congeners by the striped pattern and the shape of the bulb with small triangular lobe at half of its length on retrolateral side.

Description: Measurements. Cephalothorax length 2.8–3.0 width 2.2–2.3 height 1.2–1.4. Abdomen length 2.8–3.0, width 1.9–2.0. Eye field length 1.4, anterior 1.9, posterior width 1.9. Male. Slightly smaller than *R. feliksi* Prószyński, 1999, and less hairy, colouration pattern striped, typical for *Phlegra* species (Plate 22). Carapace elongated, brown, with short, darker eye field. Vicinity of eyes covered with long brown bristles. White hairs form two wide streaks running from anterior eyes to posterior edge of carapace. Slopes of carapace clothed also in white hairs. Clypeus brown, some white hairs on it. Chelicerae dark brown, two small teeth on promargin, retromarginal edge toothless. Mouthparts slightly lighter, sternum light brown with large darker spot. Abdomen brown with wide median white stripe, sides and venter yellowish. Dorsum of abdomen covered with dense hairs, longer and bushier at anterior edge. Spinnerets light. Legs dark yellow to orange with brown spots. First pair darker than remaining, femur and patella brownish, darker ventrally, tibia almost black. Leg hairs greyish and brown, dark scopulae. Pedipalps light, only base of femur brown, long white hairs densely cover palpal femur, patella and tibia, only on cymbium hairs dark. Tegulum large, convex, with characteristic small triangular lobe at half of its length on retrolateral edge, visible end of embolus very short (Fig. 74).

Female unknown.

Etymology: The specific name refers to the presence of desert habitats in the UAE.

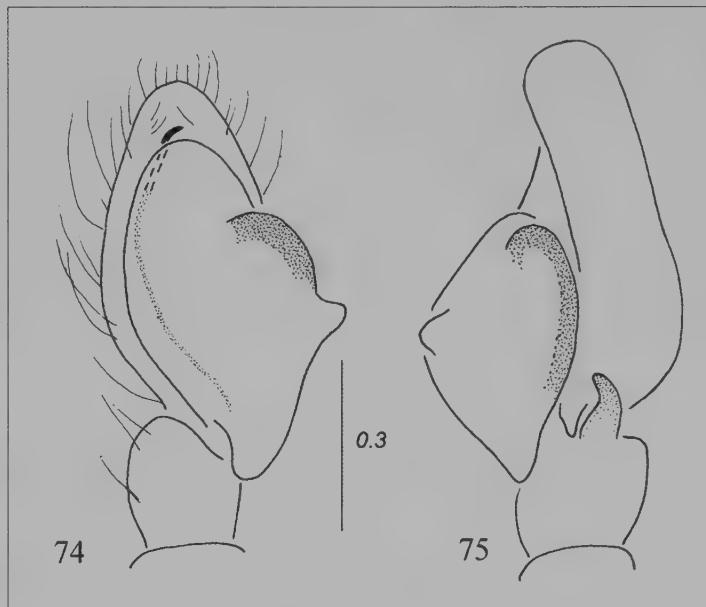
***Rafalus feliksi* Prószyński, 1999**

Figures 76–82

Specimens examined: Wadi Shawkah, 1♀, 31.x–27.xi.2006, WT; 1♀, 5–12.v.2007, WT; 2♂, 19–22.v.2007, WT; 2♂, 30.vi–2.viii.2007, WT; 3♂, 25.v–12.vi.2008, WT. Near Um al-Quwain, 1♂, 1♀, 1–30.xi.2008, PT.

Description: Measurements (male/female). Cephalothorax length 3.1–3.3/3.0–3.2, width 2.1–2.6/2.3–2.5, height 1.3–1.4/1.2–1.3. Abdomen length 2.7–3.5/3.5–3.7, width 1.9–2.4/2.5–3.0. Eye field length 1.2/1.0–1.1, anterior 1.9/1.6–1.8, posterior width 1.8/1.7–1.9.

Male. Medium-sized, very pilose spider. Carapace dark brown with black eye field, densely clothed in delicate whitish grey hairs, among them sparse brown setae, denser and very long on anterior part of eye field. Anterior eyes surrounded by white scales. Chelicerae brown, their bases dorsally clothed in dense reddish hairs, some white hairs on clypeus. Labium orange with darker base, gnathocoxae with whitish inner margins. sternum light brown. Abdomen greyish brown, its dorsum covered with small brown scutum, occupying less than half of the abdomen length, posterior part clothed in brown and reddish hairs. Venter yellow. Spinnerets dark. Legs yellow, femora I and II covered with very dense, long white hairs (sometimes with admixture of black, scale-like ones), in some specimens at distal end of



Figures 74–75. *Rafalus desertus* nov. spec. 74: Palpal organ in ventral view; 75: Same in lateral view.

femur I and II ventrally dark patch. Spines numerous, long. Leg hairs dense, blackish. Dark scutulae on all tarsi. Pedipalps yellow, densely covered with long white hairs and scattered dark brown hairs. Palpal structure as in Figures 76 and 77, embolus hidden, only its tip visible, with accompanying terminal apophysis (Figs 78, 79).

Female. Carapace as in male, chelicerae dark brown, without reddish hairs. Traces of two parallel streaks below anterior lateral eyes, on ‘cheeks’. Mouthparts brown with lighter tips, sternum yellowish grey. Abdomen blackish grey, densely covered with light grey and fawn hairs (abdominal pattern composed of greyish and brownish fawn patches), among them sparse brown setae, venter yellow tinged with grey. Spinnerets dark. Legs yellow to light brown with darker rings and spots. Epigyne weakly sclerotised, with single pocket at epigastric furrow (Figs 80, 81). Seminal ducts tube-like, receptacles strongly sclerotised, five-chambered, compact (Fig. 82).

Remarks: The first description of the male is given here. The male of the species is similar to *Rafalus christophori* Prószyński, 1999, and may be recognized by the presence of dense orange hairs on the dorsal surfaces of the chelicerae.

Distribution: So far this species was known only from Egypt. New to the UAE.

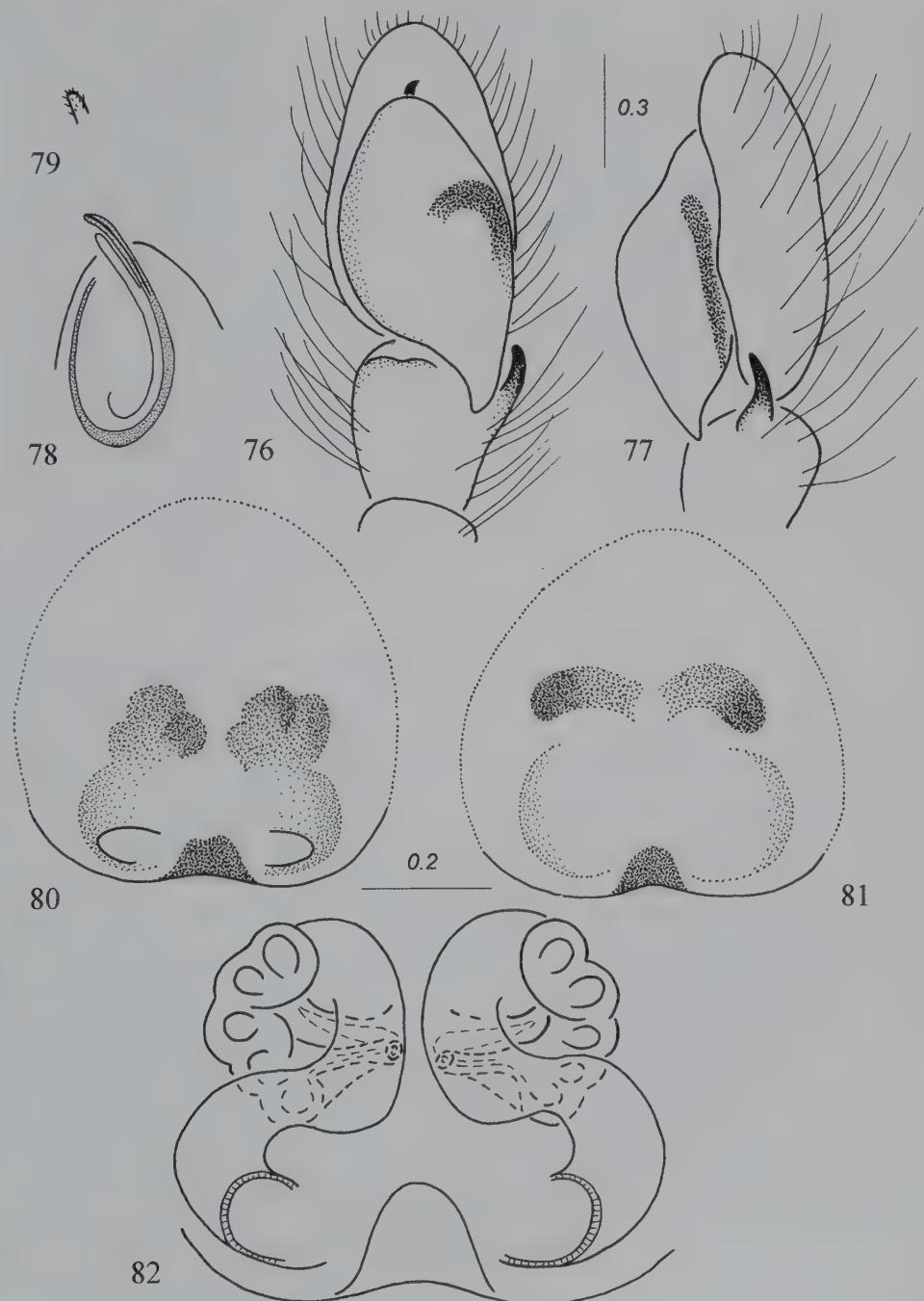
Rafalus minimus Wesołowska & van Harten nov. spec.

Plate 23, Figures 83–86

Specimens examined: Holotype: ♂, United Arab Emirates, N of Ajman, 25°26'N 55°29'E, 15–16.iii.2009, in water trap, leg. A. van Harten (MRAC). Paratypes: 2♂, same data as holotype.

Diagnosis: The species differs from congeners by the smaller size and by short, wide tibial apophysis of male palp.

Description: Measurements. Cephalothorax length 2.1–2.3, width 1.5–1.6, height 0.9–1.0. Abdomen length 1.9–2.1, width 1.4–1.5. Eye field length 0.8–0.9, anterior 1.2–1.3, posterior width 1.3.



Figures 76-82. *Rafalus feliksi* Prószyński. 76: Palpal organ in ventral view; 77: Same in lateral view; 78: Embolus in dorsal view (cymbium removed); 79: Tip of terminal apophysis; 80, 81: Epigynes; 82: Internal structure of epigyne.



20



21

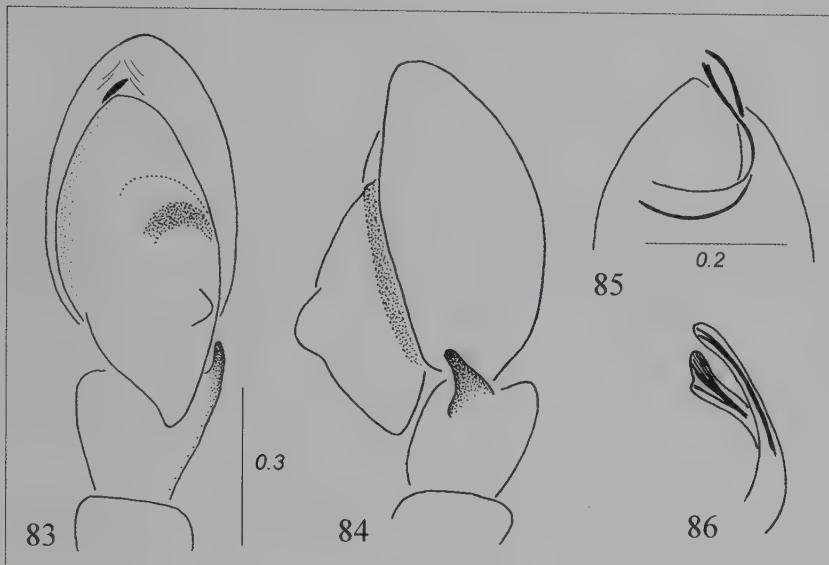


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Plates 20–23. 20: *Rafalus arabicus* nov. spec., male; 21: *Rafalus arabicus* nov. spec., female; 22: *Rafalus desertus* nov. spec., male; 23: *Rafalus minimus* nov. spec., male.



Figures 83–86. *Rafalus minimus* nov. spec. 83: Palpal organ in ventral view; 84: Same in lateral view; 85: Embolus in dorsal view (cymbium removed); 86: Tip of embolus.

Male. Small species, smaller and less hairy than other congeners, colouration pattern striped, typical for *Phlegra* species (Plate 23). Carapace oval, slightly broader posteriorly, dark brown with two white longitudinal bands composed of light hairs. Slopes with some greyish hairs. Eye field short, long brown bristles near eyes. Clypeus brown with some grey hairs. Mouthparts and sternum dark brown, only inner margins of gnathocoxae yellowish. Dark patches on coxae. Abdomen ovoid, brown with whitish median stripe, covered with short hairs, among them sparse longer brown bristles. Sides of abdomen yellow, venter yellow tinged with grey. Spinnerets light, bases of posterior ones blackish. Legs I and II brownish with lighter metatarsi and tarsi, posterior pairs yellow, but lateral sides of femora brown and brown rings at bases of tibiae and metatarsi. Pedipalps yellowish, only basis of femur brown. Tibial apophysis short, wide at base (Fig. 84), embolus as in Figures 85 and 86.

Female unknown.

Etymology: The specific name refers to the small size of this species.

Thyene imperialis (Rossi, 1846)

Specimens examined: Al-Ajban, 2♂, 1♀, 9.xi–7.xii.2005, LT; 1♂, 1♀, 7–28.xii.2005, MT; 1♂, 27.v–26.vi.2006, MT; 1♂, 27.iii.2008, HC, leg. K. Mahmood. N of Ajman, 2♂, 11–16.xi.2006, WT; 1♂, 22.ix–17.x.2008, WT. Fujairah, 1♂, 5.iii–6.iv.2005, LT. Ghayl, 1♂, 17.iii.2008, HC. Hatta, 1♂, 19–28.iii.2006, LT. 7 km S of al-Jazirat al-Hamra, 1♂, 4.i.2005, HC; 1♂, 27.ii.2006, HC. S of Ras al-Kaimah, 1♂, 8.iii.2008, HC. Sharjah, 1♀, 28.vi–23.vii.2005, LT. Sharjah Desert Park, 1♂, 5–6.x.2004, HC; 1♂, 17.xi.2004, HC; 1♀, 3.iii.2005, HC; 1♀, 21.vii–5.viii.2005, LT; 1♂, 21–28.v.2007, LT; 1♀, 14.ii–1.iv.2008, LT. NARC, near Sweihan, 1♂, 14.iii–2.iv.2005, LT. Near Um al-Quwain, 1♂, 23–26.vi.2008, WT. Wadi Bih dam, 1♂, 17–25.iii.2008, LT. Wadi Maidaq, 1♀, 29.xi–22.xii.2005, LT; 2♂, 4–15.ii.2006, WT; 1♂, 7–14.iii.2006, WT; 1♂, 29.iii–10.iv.2006, WT; 1♀, 27.vi–29.vii.2006, MT; 1♂, 1♀, 29.vii–26.viii.2006, MT; 3♂, 1♀, 24.ix–22.x.2006, WT; 3♂, 26.x–9.xi.2006, WT; 1♂, 18.xi–15.xii.2007, PT; 2♂, 20.i–3.ii.2008, WT; 1♂, 2♀, 3–17.ii.2008, WT. Wadi Safad, 1♂, 1♀, 28.xi–1.xii.2005, WT; 2♂, 1♀, 26.xii.2005–2.i.2006, WT. Wadi Shawkah, 1♂, 31.x–27.xi.2006, WT; 2♂, 1-

9.iv.2007, WT; 2♂, 5–12.v.2007, WT; 1♂, 30.vi–2.viii.2007, WT; 1♂, 20.i–18.ii.2008, WT; 1♂, 3–18.ii.2008, WT; 1♂, 25.v–12.vi.2008, WT. Wadi Wurayah, 1♂, 14.xi.2006, HC. Al-Wathba wetland reserve, 1♂, 2 juv., 23.viii.2004, HC.

Description: See Metzner (1999).

Distribution: A species widely distributed in eastern Africa and southern Asia. New to the UAE.

Yllenus logunovi Wesołowska & van Harten nov. spec.

Plate 12, Figures 87–91

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Bih dam, 25°48'N 56°04'E, 24–29.vi.2008, in light trap, leg. A. van Harten (MRAC). Paratypes: 2♂, 2♀, same data as holotype. 1♂, N of Ajman, 16.ix–12.x.2006, WT; 5♂, 1♀, 27.iv.2008, WT; 1♂, 1♀, 5.v–11.vi.2008, WT; 13♂, 5–16.7.2008, WT; 3♂, 2♀, 5–16.vii.2008, WT; 6♂, 2♀, 16–23.vii.2008, WT; 2♂, 27–30.iv.2008, WT; 2♀, 18–22.v.2008, WT; 2♂, 1♀, 25.v–12.vi.2008, WT; 8♂, 4♀, 25.vi–5.vii.2008, WT; 1♂, 16–23.vii.2008, WT; 1♂, 2♀, 22.ix–12.x.2008, WT; 2♂, 1–14.ii.2009, WT; 1♂, 1♀, 15–16.iii.2009, WT, leg. C. Schmid-Egger. 1♂, S of Ra's al-Khaimah, 25–26.iii.2008, WT, leg. J. Bosák. 5♂, near Um al-Quwain, 1–30.xi.2008, PT; 3♂, 23–26.vi.2008, WT; 1♂, 2♀, 11–13.iii.2009, WT.

Diagnosis: The species is related to *Y. salsicola* (Simon, 1937); the male may be recognised by smaller tegulum, narrower terminal apophysis accompanying embolus and straight tibial apophysis; the female has simpler epigyne, with clearly shorter seminal ducts.

Description: Measurements. Cephalothorax length 1.5–1.8/1.7–2.0, width 1.4–1.7/1.6–1.8, height 0.8–0.9/0.9–1.0. Abdomen length 1.6–1.8/2.0–2.2, width 1.2–1.4/1.7–2.1. Eye field length 0.7–0.8/0.9–1.0, anterior width 1.1–1.2/1.1–1.3, posterior width 1.3–1.4/1.4–1.5.

Male. General appearance as in Plate 12. Small, swollen spider. Carapace high, sloping behind ocular area, dark brown with two longitudinal white streaks composed of light hairs. Anterior part of eye field covered with small light scales. Clypeus brown, clothed in whitish hairs. Chelicerae dark brown, mouthparts light brown with paler apices. Abdomen whitish with wide median brown band and two poorly marked lateral brownish stripes, sides and venter yellow. Dorsum of abdomen covered with dense hairs. Spinnerets beige. Legs yellow with brown patches, dark scopule on tarsi. Pedipalps brownish. Tibial apophysis straight, cymbial process well developed (Fig. 89). Tegulum small, posteriorly narrower (Figs 87, 88).

Female. Slightly larger than male. Carapace brown, eye field blackish, only its anterior part lighter, clothed in light scales. Thoracic part light brown with median darker belt. Numerous whitish grey hairs cover carapace. Abdomen rounded, yellow or fawn with indistinct median brown streak, whole abdomen clothed in dense greyish hairs. In some specimens abdomen darker, with indistinct pattern composed of grey chevrons and spots. Venter yellowish or grey. Legs as in male, lighter coloured. Epigyne typical for the genus (Fig. 90). Internal structures simple, seminal ducts short, receptacles spherical (Fig. 91).

Remarks: This species belongs to the *albocinctus* species group (see Logunov & Marusik, 2003).

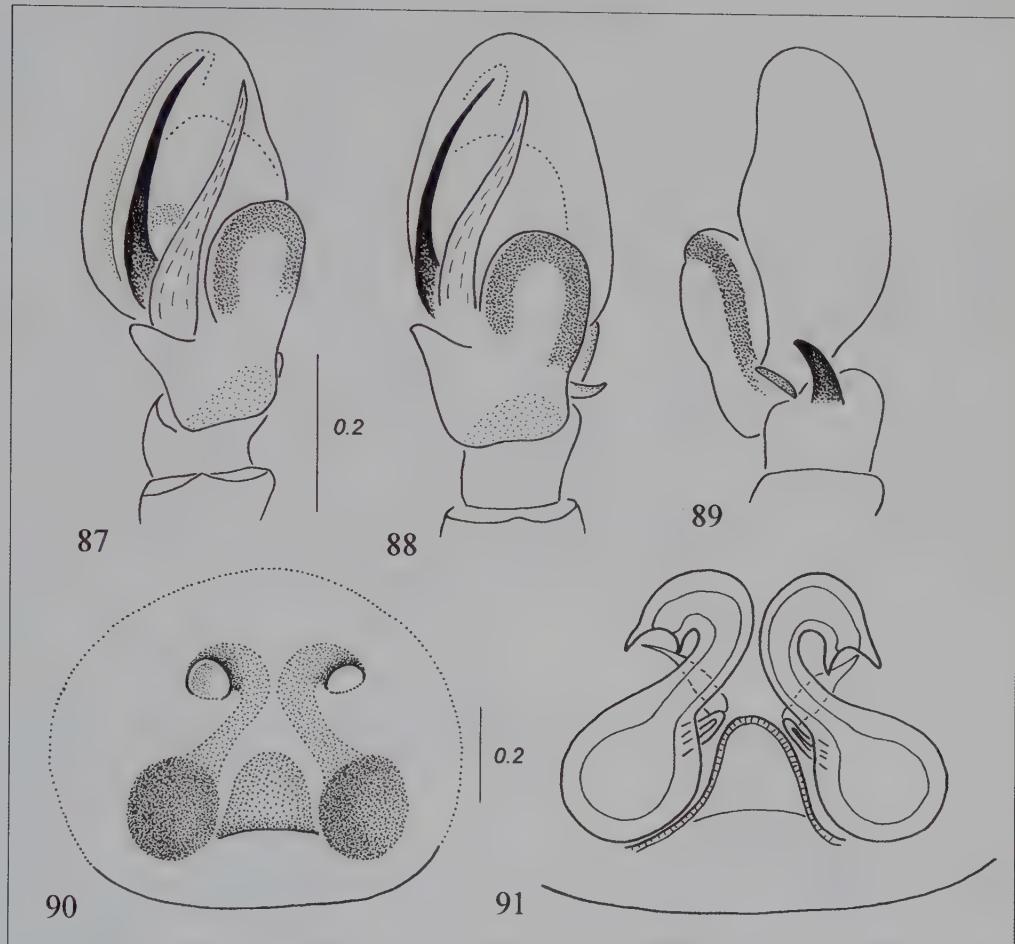
Etymology: This species is named after Dr Dmitri Logunov, excellent specialist of salticids, who recently revised the genus *Yllenus*.

Yllenus tschoni (Caporiacco, 1936)

Figures 92–97

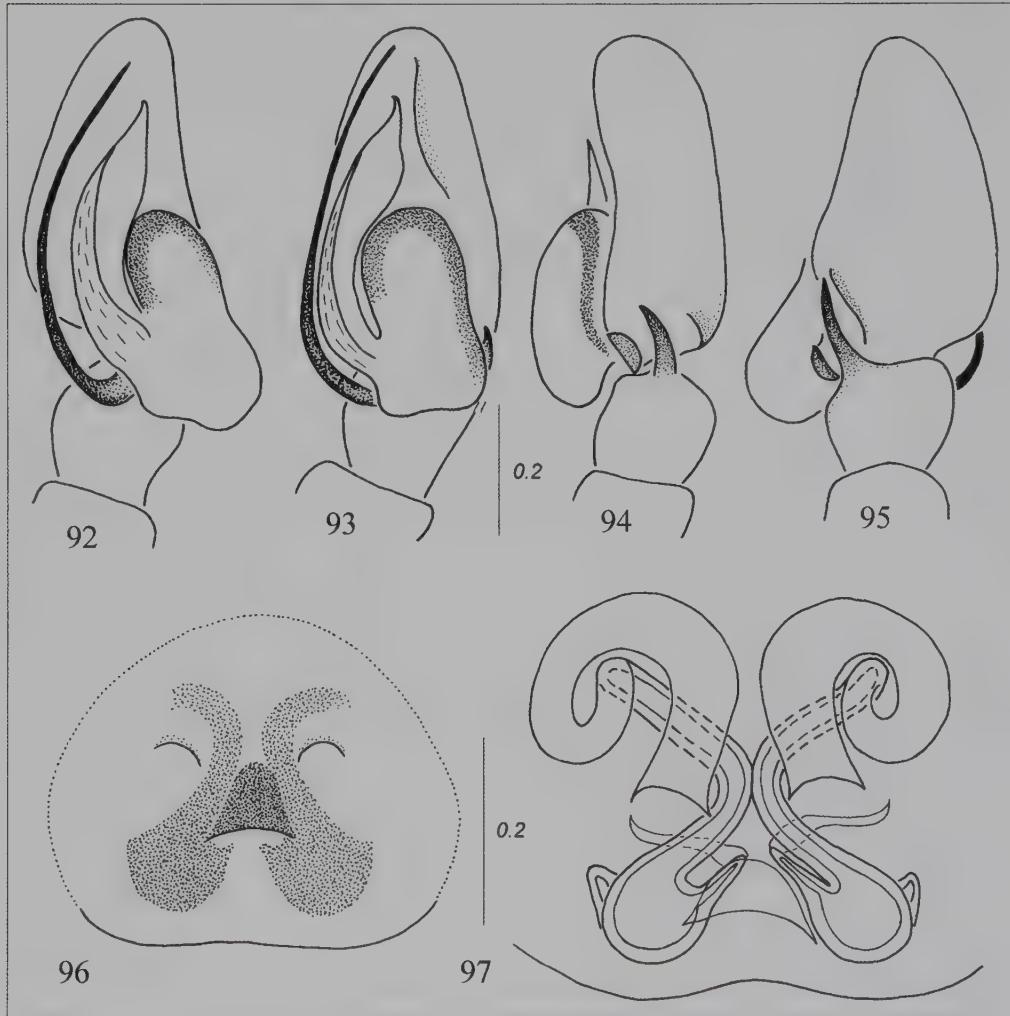
Specimens examined: 7 km S of al-Jazirat al-Hamra, 1♂, 1.xii.2004, WT. Al-Rafah, 1♀, 27–30.iv.2008, WT; 2♂, 1–12.ii.2009, WT. Sharjah Desert Park, 1♂, 22.xi.2004, WT; 1♂, 1–30.xi.2008, PT.

Description: Measurements. Cephalothorax length 1.5–1.7/2.1, width 1.5–1.6/2.0, height 1.0–1.1/1.2. Abdomen length 1.8–2.0/2.9, width 1.2–1.4/2.4. Eye field length 0.7–0.8/1.0, anterior width 1.0–1.1/1.5, posterior width 1.2–1.3/1.8.



Figures 87–91. *Yllemus logunovi* nov. spec. 87: Palpal organ in ventrolateral view; 88: Same in ventral view; 89: Same in lateral view; 90: Epigyne; 91: Internal structure of epigyne.

Male. Small spider with short legs. Carapace rounded, high in cephalic part, highest approximately at posterior lateral eyes, and sloping behind eye field. Colouration of carapace dark brown, darker near eyes, eye field covered with numerous small scales, which form large yellowish spot on anterior part of eye field. Long brown bristles in vicinity of eyes. On thoracic part two white stripes running from posterior lateral eyes to posterior edge of carapace. Clypeus clothed in long dense white hairs extending to lateral sides of carapace. Mouthparts and sternum brown. Abdomen ovoid, brown with two broad longitudinal white bands, venter yellowish. Spinneters light with brown tips. Legs short, dark yellow, in some specimens with brown patches on lateral surfaces of femora and tibiae, also metatarsi apically brown. Leg hairs long, dense, white. Palpal structure as in Figures 92–95, tibial apophysis long, embolus long, with accompanying large ‘membraneous conductor’.



Figures 92–97. *Yllenus tschoni* (Caporiacco). 92: Palpal organ in ventrolateral view; 93: Same in ventral view; 94: Same in lateral view; 95: Same in dorsal view; 96: Epigyne; 97: Internal structure of epigyne.

Female. Carapace high, brown, eye field black laterally. Whole carapace densely covered with short whitish hairs, especially densely on slopes. Fawn scales surround anterior eyes and form spot on eye field anteriorly. Chelicerae dark brown, gnathocoxae and labium light brown with whitish tips, sternum brown with large light central patch. Abdomen swollen, greyish beige with broad brown streak. Dense light hairs cover abdomen, among them sparse brown setae. Spinnerets beige. Legs orange, their hairs light, on tarsi dark scopule. Epigyne with central pocket (Fig. 90). Seminal ducts long, their initial weakly sclerotised part forms loop (Fig. 97).

Remarks: The species was reported as *Yllenus saliens* (O. P.-Cambridge, 1876) (misidentified) by Denis (1966) from Algeria and by Prószyński (1968) from Egypt.

Distribution: Hitherto this species is known from Algeria, Libya, Egypt and Israel. New to the UAE.

DISCUSSION

The paper presents the first information on salticids from the UAE, listing 30 species. Despite a large collecting effort (five years, several methods), the number of species recorded most probably is only a minimal number.

From Yemen 82 jumping spiders species are known, but this country is far greater, has considerably more diverse habitats and more wet sites with luxuriant vegetation. From Saudi Arabia only 28 species are reported, but the spider fauna of that country is very poorly studied.

A third of recorded salticids (10 species) are common in the UAE: *Bianor albobimaculatus*, *Evarcha seyun*, *Heliophanillus fulgens*, *Langona pallida*, *Neaetha oculata*, *Pellenes geniculatus*, *Plexippus paykulli*, *Rafalus arabicus*, *Thyene imperialis* and *Yllenus logunovi*. Two of them – *R. arabicus* and *Y. logunovi* – are newly described and may be endemic species. A few others – *Bianor albobimaculatus*, *Pellenes geniculatus*, *Plexippus paykulli* and *Thyene imperialis* – are widely distributed and common everywhere in their ranges. Some species, eg. *Heliophanus abditus*, *Mogrus logunovi*, *Myrmarachne tristis*, and *Yllenus tschoni*, have a typical eremic distribution.

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Plates 24–25. 24: *Bianor albobimaculatus* (Lucas), male, from Greece; 25: *Evarcha dotata* (Peckham & Peckham), male, frontal view, specimen from Yemen.



Plates 26–27. *Evacha dotata* (Peckham & Peckham). 26: Male, dorsally; 27: Female, frontally. Specimens from Yemen.



28



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Plates 28–29. 28: *Heliophanillus fulgens* (O. P.-Cambridge); 29: *Myrmarachne tristis* (Simon). Specimens from Yemen.



30



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Plates 30–31. *Phlegra bresnieri* (Lusas), male. 30: Dorsally; 31: Frontally. Specimens from Yemen.



32



33

Plates 32–33. *Thyene imperialis* (Rossi). 32: Male; 33: Female. Specimens from Yemen.

Order Orthoptera

Bruno Massa, Filippo Maria Buzzetti and Paolo Fontana

INTRODUCTION

The Orthoptera fauna of the UAE prior to 2007 was relatively well known. During the period 1980–2004, several authors published about collections made in the country (Popov, 1980, 1981, 1997; Walker & Pittaway, 1987; Gassouma, 1991, 2003; Wingate, 1992; Gorochov, 1993; Tigar & Osborne, 1999; Gillett, 2000, 2003; Gillett & Gillett, 2003; Gillett & Howarth, 2004). In total, 59 species in 7 families were recorded. Collecting data and localities of those records are summarized in van Harten (2005).

In 2006 Antonius van Harten invited us to come and collect Orthoptera in the United Arab Emirates in the framework of the UAE Insect Project. From 3rd to 12th March 2007, two of us, B. Massa and P. Fontana, collected specimens in the UAE. Some species not previously known from the country were collected and the calling songs of 4 species were recorded. The results of the trip are here published, as well as a few comments on species names used by former authors. A complete list of all species recorded so far is given in Annex 1. Habitus photographs of 26 species are also included.

MATERIALS AND METHODS

The specimens studied were collected during a collecting trip (3–12 March 2007) made by B. Massa and P. Fontana, with additional specimens collected by A. van Harten (UAE Insect Project). They have been divided over the private collections collections of B. Massa and P. Fontana (Palermo, Italy, and Isola Vic, Italy, respectively), and the UAE Invertebrate Collection. Coordinates and altitudes of the localities are listed in the introduction of this volume. The habitats of the localities visited were following (from North to South): N of Ra's al-Khaimah – almost destroyed coastal place with cane field; Wadi Bih dam – moderately stony, grazed place & stony place with many grasses; 7 km S of al-Jazirat al-Hamra – stony area with some *Ipomoea pescaprae*; Between Um al-Quwain and al-Jazirat al-Hamra – saltfans; Um al-Quwain – coastal sand dunes; Ajman – mangroves; Road Masafi-Dibba – stony place; Near Masafi – stony place with scarce vegetation; Masafi, near Friday Market – stony place; Wadi Maidaq – oasis & stony place; Wadi Safad – wadi with a small stream; Fujairah – saltfans & ponds behind coastal dunes; Khor Kalba road near 10th bridge – desert; E of Mahafiz – farm; Wadi Shawkah – wadi with a small stream and semicultivated area; Khor Kalba road, near tunnel – stones, *Ziziphus* and farm; Khor Kalba – mangrove and farm along the sea; Al-Samha, NE of Abu Dhabi – coastal area dominated by Chenopodiaceae; Al-Ajban – reforested dry place & irrigated meadow.

Male calling songs of some species were recorded with an Edirol R09 digital recorder, the songs obtained were sampled with CoolEdit 2.0.

Abbreviations used in the text: AvH = A. van Harten; BM = B. Massa; PF = P. Fontana; LT = light trap; WT = water trap.

SYSTEMATIC ACCOUNT

Family Tettigoniidae

Conocephalus (Anisoptera) maculatus (Le Guillou, 1841)

Plates 1–2

Specimens examined: Khor Kalba, 2♀, 4.iii.2007, leg. BM & PF. E of Mahafiz, 3♂, 2♀, 5.iii.2007, leg. BM & PF. Wadi Maidaq, 3♂, 4♀, 7.iii.2007, leg. BM & PF.

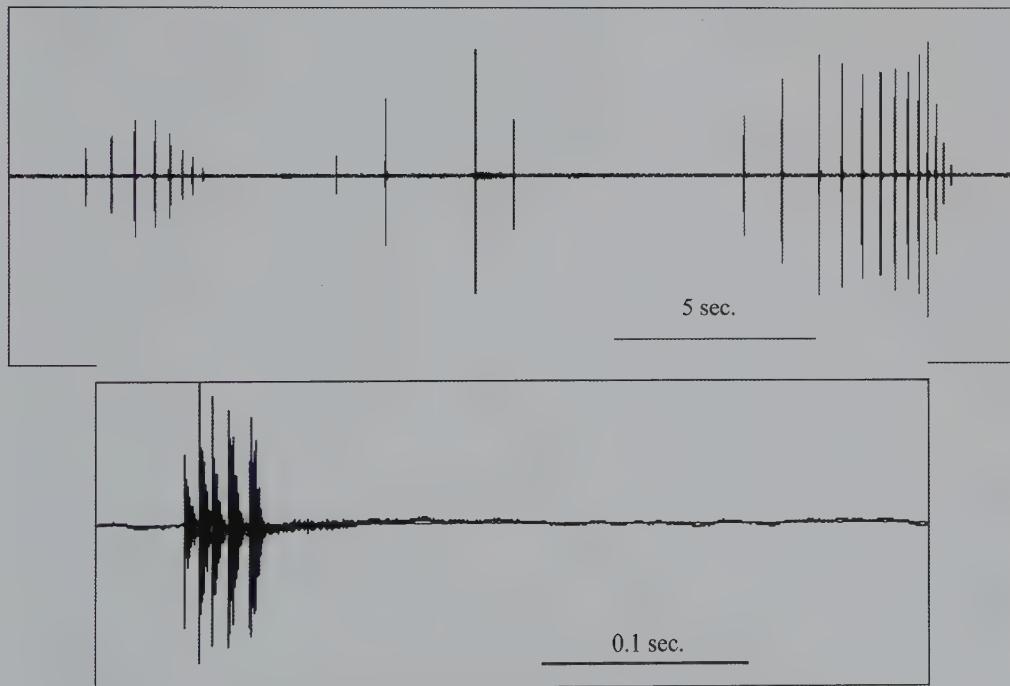
Distribution: Widespread in tropical afro-asiatic zones, Middle East, North Africa, Saudi Arabia, Yemen, India, Australia and Pacific. Previously unrecorded from the UAE.

Phaneroptera sparsa Stål, 1856

Plate 3, Figures 1–2

Specimens examined: Wadi Bih dam, 1♂, 8.iii.2007, leg. BM & PF. Wadi Safad, 2♂, 6.iii.2007, leg. BM & PF.

Calling song: The calling song of *Phaneroptera sparsa* (Fig. 1) is emitted mainly during the night and consists of syllables produced isolated or grouped in echemes containing up to 13 syllables. Single syllables last from 0.035 sec. to 0.05 sec. approximately, being separated by variably long pauses. Also, echemes (Fig. 2) are very variable in lasting and in number of syllables.



Figures 1–2. Calling song of *Phaneroptera sparsa*, from Wadi Safad, 6.iii.2007. 1: Song; 2: Echeme.

Distribution: Its distribution covers Africa S of Sahara, extending westwards to Morocco, Canary Islands and Spain, and eastwards from Arabia to Anatolia.

Family Gryllidae***Acheta confalonieri*** (Capra, 1929)

Specimens examined: Wadi Shawkah, 1♂, 3♀, 31.x–27.xi.2006, WT, leg. AvH.



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Plates 1–2. *Conocephalus (Anisoptera) maculatus* (Le Guillou). 1: Female from Khor Kalba; 2: Male from E of Mahafiz.

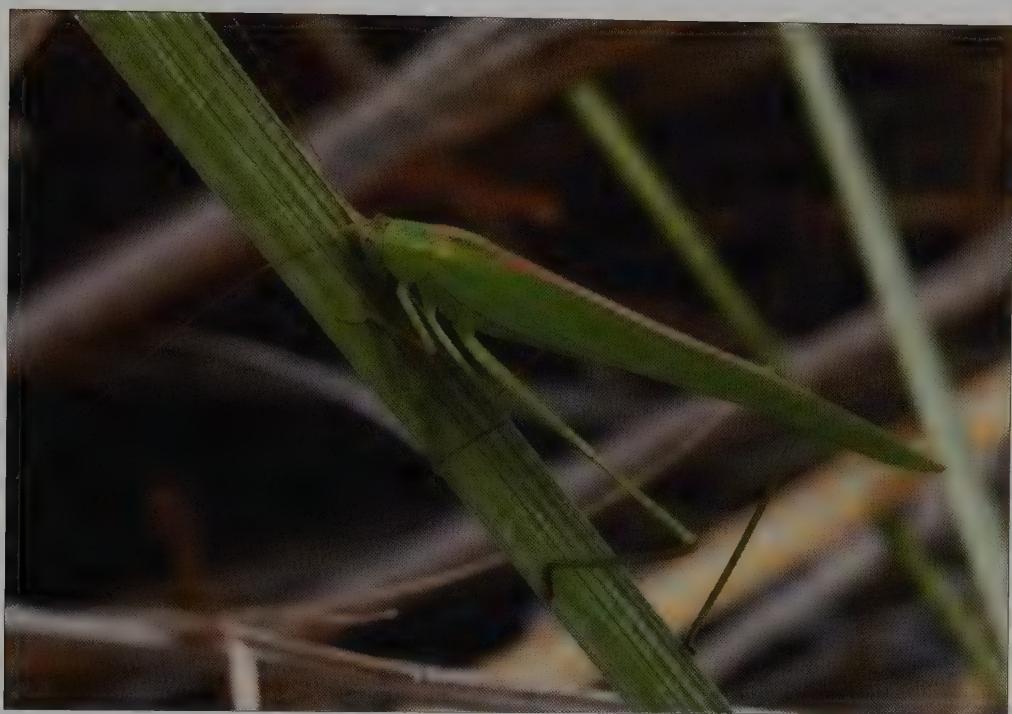


Plate 3. *Phaneroptera sparsa* Stål, male from Wadi Safad.

Distribution: Described from Libya, recorded from Saudi Arabia by Gorochov (1993). Previously unknown from the UAE.

Acheta cf. *arabica* Gorochov, 1993

Plates 4–6

Specimens examined: Sharjah-Khor Kalba, near tunnel, 3♂, 1♀, 31.v–7.vi.2006, LT, leg. AvH.

Remarks: Due to the lack of referring identified material, specimens collected are tentatively identified as *A. arabica*, but wing veinlets are just a little bit different from the drawing of Gorochov (1993). This species was described by Gorochov (1993) based on a male collected in Saudi Arabia. If the identification is correct, this would be the second record of the species, which was previously unknown from the UAE.

Description of the previously unknown female: Measurements: Total body length from frons to tip of hind wings 25.8 mm, pronotum length along midline 2.85 mm, head length along midline 2.25 mm, right fore wing 10.7 mm, right hind wing 18.2 mm, ovipositor length (strongly curved) 8.3 mm, right hind femur length 18.3 mm. Body medium sized, limbs and abdomen strongly wrinkled due to killing and storing procedure (alcohol). General colour brownish.

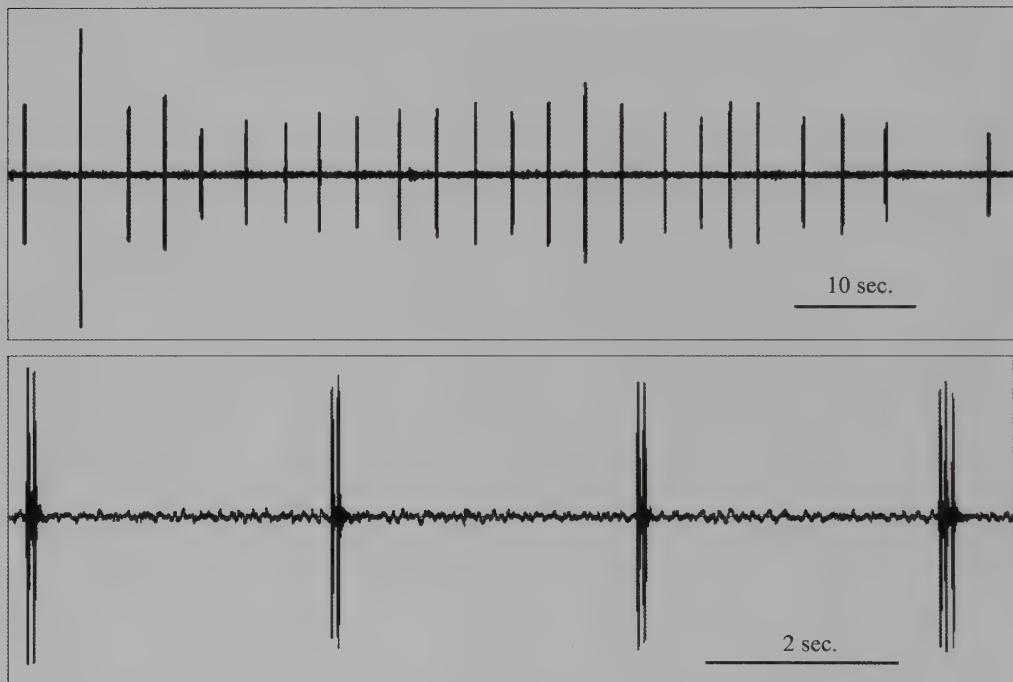
Acheta spec.

Plate 7, Figures 3–4

Specimens examined: E of Mahafiz, 1♂, 5.iii.2007, leg. BM & PF.

Remarks: This specimen, not belonging to a species previously known from the Arabian Peninsula, probably belongs to a new species. Further material is necessary before final identification or description is possible.

Calling song: The calling song of *Acheta* spec. (Fig. 3) is produced during the night as a long (more than 1 min.) series of loud diplosyllabic echemes. Trisyllabic echemes (Fig. 4) are also emitted. Each syllable lasts for about 0.05 sec.



Figures 3–4. Calling song of *Acheta* spec., from E of Mahafiz, 5.iii.2007. 3: Song; 4: Echemes.

Gryllodes supplicans (Walker, 1859)

Specimens examined: E of Mahafiz, 1♂, 5.iii.2007, leg. BM & PF.

Remarks: The status of this species is unclear since the types have different data (Eades & Otte, 2009).

Calling song: The calling song of *Gryllodes supplicans* (Fig. 5) is a continuous (more than 1 min. long) repetition of syllables.

Plate 8, Figure 5



Fig. 5. Calling song of *Gryllodes supplicans* (Walker), from E of Mahafiz, 5.iii.2007.



Plates 4–6. *Acheta* cf. *arabica* Gorochov. 4: Female, dorsally; 5: Female, laterally; 6: Male, wing venation.



Plates 7–8. 7: *Acheta* spec., male from E of Mahafiz; 8: *Gryllodes supplicans* (Walker), male from E of Mahafiz.

Distribution: Reported from Saudi Arabia and Yemen (Gorochov, 1993), previously unknown from the UAE.

***Gryllopsis* spec.**

Plates 9–10

Specimens examined: Near Masafi, 1♂, 1♀, 11.iii.2007, leg. BM & PF.

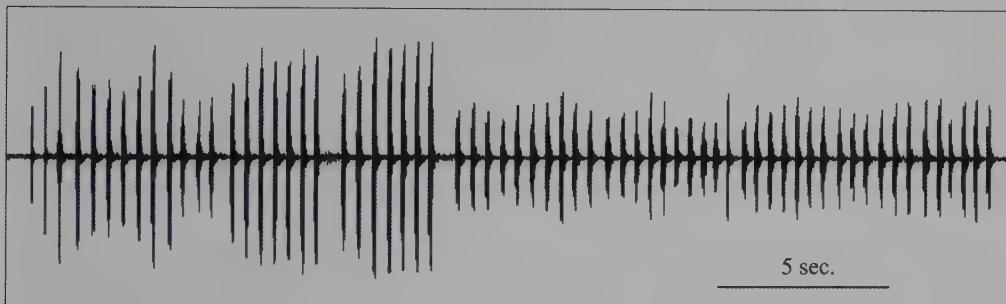
Remarks: The genus *Gryllopsis* Chopard, 1928, was not before known from the UAE. Due to availability of insufficient material, the identification of the species was impossible.

***Gryllus (Gryllus) bimaculatus* DeGeer, 1773**

Plate 11, Figures 6–7

Specimens examined: E of Mahafiz, 1♂, 1♀, 5.iii.2007, leg. BM & PF. Wadi Bih dam, 1♂, 8.iii.2007, leg. BM & PF. Wadi Maidaq, 1♂, 1♀, 7.iii.2007, leg. BM & PF.

Calling song: The calling song of males of *Gryllus bimaculatus* from the UAE (Fig. 6) is identical to that of conspecific males from Europe, consisting of a long (up to 1 min) repetition of trisyllabic echemes (Fig. 7).



Figures 6–7. Calling song of *Gryllus (Gryllus) bimaculatus* DeGeer, from E of Mahafiz, 5.iii.2007. 6: Song; 7: Echemes.

Distribution: Widespread in Mediterranean Europe, Africa and Asia, including the UAE.

***Trigonidium cicindeloides* Rambur, 1839**

Plate 12

Specimens examined: Khor Kalba, 1♂, 1♀, 4.iii.2007, leg. BM & PF. Khor Kalba road, 1♀, 4.iii.2007, leg. BM & PF.

Distribution: Widespread in Asia, Africa, S Europe, Saudi Arabia and the Middle East. Previously unrecorded from the UAE.

Family Gryllotalpidae



Plates 9–10. *Gryllopsis* spec., from near Masafi. 9: Female; 10: Male.



Plates 11–12. 11: *Gryllus (Gryllus) bimaculatus* DeGeer, male from E of Mahafiz; 12: *Trigonidium cicindeloides* Rambur, female from Khor Kalba road, near tunnel.

Although species of the genus *Gryllotalpa* are common in the Arabian Peninsula (Plates 13–14), it is at the moment not very clear whether common African and European species are occurring or whether most species are geographically more restricted. Great caution should therefore be used when identifying.

***Gryllotalpa africana* Palisot de Beauvois, 1805**

Remarks: Tigar & Osborne (1999) recorded this species from Abu Dhabi Emirate, but as species was not before recorded from the Arabian Peninsula (see Gorochov, 1993), there could be doubt about its true identity.

***Gryllotalpa debilis* Gerstäcker, 1869**

Specimens examined: Sharjah Desert Park, 1♂, 6–28.xii.2006, LT, leg. AvH.

Distribution: Described from Tanzania. Gorochov (1993) recorded it from Saudi Arabia, UAE and Oman.

***Gryllotalpa stepposa* (Zhantiev, 1991)**

Remarks: Gillett & Howarth (2004) reported this species from Jebel Hafit. According to Gorochov (1993), this species possibly is a complex of similar species which differ from each other by their karyotypes. Thus, he conditionally recorded it from Saudi Arabia, Oman and Iraq.

***Gryllotalpa gryllotalpa* (Linnaeus, 1758)**

Remarks: Gillett & Howarth (2004) reported the European species *Gryllotalpa gryllotalpa* (Linnaeus, 1758) from Jebel Hafit. This identification could be considered doubtful as the species had not before been mentioned from the Arabian Peninsula.

Family Tetrigidae

***Euparatettix histricus* (Stål, 1861)**

Plates 15–16

Specimens examined: Wadi Maidaq, 1♂, 2♀, 7.iii.2007, leg. BM & PF. Wadi Shawkah, 2♂, 4♀, 5.iii.2007, leg. BM & PF.

Remarks: Listed by Walker & Pittaway (1987) as *Euparatettix ocellatus* Uvarov, 1936, now considered as synonym of *E. histricus*.

Distribution: Widespread in Asia.

***Hedotettix alienus* Uvarov, 1936**

Plates 17–19

Specimens examined: Khor Kalba, 4♂, 4♀, 4.iii.2007, leg. BM & PF. Khor Kalba road, 1♂, 4.iii.2007, leg. BM & PF. Wadi Maidaq, 1♀; 7.iii.2007, leg. BM & PF.

Distribution: Known from the Arabian Peninsula and W Asia. New to the UAE.

Family Trydactylidae

***Asiotridactylus fasciatus* (Guérin-Méneville, 1844)**

Specimens examined: Near Mahafiz, 2♂, 7–14.ix.2006, LT, leg. AvH. Sharjah–Khor Kalba, near tunnel, 2♂, 3♀, 7–14.vi.2006, LT, leg. AvH.

Distribution: Known from E Africa to the Arabian Peninsula, including the UAE.



Plates 13–14. 13: *Gryllotalpa* spec., nymph, from N of Ra's al-Khaimah; 14: Excavations made by *Gryllotalpa* spec., Wadi Bih dam.



Plates 15–16. *Euparatettix histricus* (Stål). 15: Brown female from Wadi Shawkah; 16: Greenish female from Wadi Maidaq.

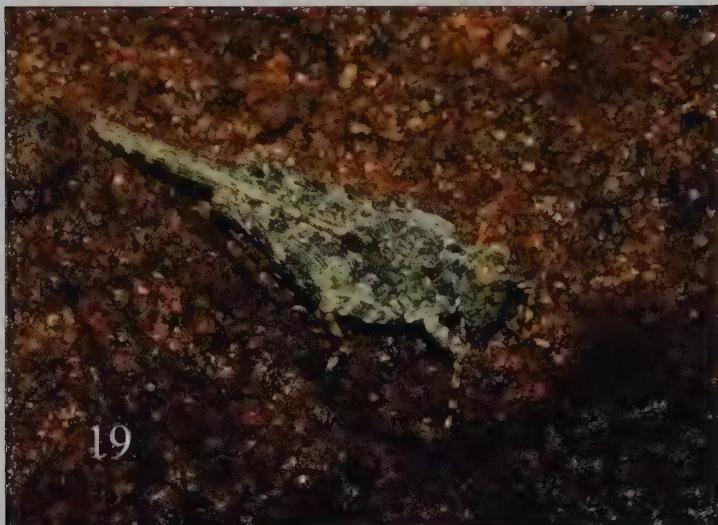


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Plates 17–18. *Hedotettix alienus* Uvarov. 17: Female from Khor Kalba; 18: Brown male from Khor Kalba road, near tunnel.



Plates 19–20. 19: *Hedotettix alienus* Uvarov, greenish male from Khor Kalba; 20: *Xya* spec., from Wadi Shawkah

***Xya* spec.**

Specimens examined: Wadi Shawkah, 1 juv., 31.x–27.xi.2006, WT, leg. AvH; 1♂, 5.iii.2007, leg. BM & PF.

Remarks: It was not possible to identify the species, given that only two specimens were collected and that this genus systematically is difficult. They could belong to a new species, but further material is needed.

Plate 20

Family Pyrgomorphidae

Chrotogonus homalodemus homalodemus (Blanchard, 1836) Plates 21–24
 Specimens examined: 7 km S of al-Jazirat al-Hamra, 2♂, 3.iii.2007. leg. BM & PF. E of Mahafiz, 1♂, 1♀, 5.iii.2007, leg. BM & PF. Wadi Shawkah, 10♂, 10♀, 5.iii.2007. leg. BM & PF.
 Distribution: NE Africa, E Africa, SW Asia and the Arabian Peninsula. Quoted from the UAE by Gassouma (2003) as *Chrotogonus* spec.

Pyrgomorpha cognata minima Uvarov, 1943

Cited from the UAE by Gillett (2000) and Gassouma (2003). Described from Africa. The systematics of *Pyrgomorpha cognata/conica* are not clear (see below).

Pyrgomorpha conica tereticornis (Brullé, 1840)

Plates 25–30

Specimens examined: Al-Ajban, 3♀, 10.iii.2007. 7 km S of al-Jazirat al-Hamra, 2♂, 5♀, 3.iii.2007. Khor Kalba, 1♂, 4.iii.2007. Khor Kalba road, 4♂; 7♀, 4.iii.2007. Masafi, 7♂, 9♀, 12.iii.2007. Masafi-Dibba road, 2♀, 12.iii.2007. Al-Samha, NE of Abu Dhabi, 8♂; 13♀, 10.iii.2007. Um al-Quwain, 1♂, 8.iii.2007; 1♀, 11.iii.2007. Wadi Bahai, 2♂, 3♀, 8.iii.2007. Wadi Midaq, 3♂, 7.iii.2007. Wadi Safad, 1♀, 6.iii.2007. Wadi Shawkah, 7♂, 10♀, 5.iii.2007. All leg. BM & PF.

Remarks: The genus *Pyrgomorpha* Serville, 1838, according to some authors comprises two subgenera, the nominal one and *Phymelloides* Kevan & Akbar, 1963, plus other species not assigned to any of these subgenera. Furthermore, the status of the species *P. conica* (Olivier, 1791) and *P. cognata* Krauss, 1977, is rather confused, since some authors (Mestre, 1988; Launois-Luong & Lecoq, 1989; Buzzetti et al., 2005) group some taxa of *P. conica* and *P. bispinosa* Walker, 1870, under *cognata*, others (Popov, 1980, 1997) consider all species of the genus as good species. Nevertheless, all agree that the morphology of these taxa is very similar and their distribution is partially overlapping so that specimens of *conica* and *cognata* are sometimes difficult to tell apart. In the present study we follow the status used by Popov (1997) in his studies on Arabian Orthoptera.

Distribution: Widely spread in the Arabian Peninsula, including the UAE. Cited as *Pyrgomorpha* spec. from the UAE by Gassouma (2003).

Tenuitarsus angustus (Blanchard, 1836)

Plates 31–33

Specimens examined: Um al-Quwain, 1♂, 2♀, 8.iii.2007, leg. BM & PF; 8♂, 11.iii.2007, leg. BM & PF. Al-Samha, NE of Abu Dhabi, 1♂, 1♀, 10.iii.2007, leg. BM & PF.

Distribution: Sahara from Morocco to Egypt, Sudan, Somalia, Eritrea, SW Asia, Arabian Peninsula, including the UAE.

Family Acrididae

Heteracris annulosa annulosa Walker, 1870

Plates 34–36

Specimens examined: 7 km S of al-Jazirat al-Hamra 1♂, 3.iii.2007. Khor Kalba, 2♀, 4.iii.2007. 2007. Masafi, 3♂; 2♀, 6.iii.2007. Near Masafi, 2♂; 11.iii.2007. Masafi-Dibba road, 1♀, 12.iii.2007. N of Ra's al-Khaimah, 3♂, 12.iii.2007. Al-Samha, NE of Abu Dhabi, 2♀, 10.iii.2007. Wadi Midaq, 1♂, 3♀, 7.iii.2007. Wadi Safad, 1♂, 2♀, 6.iii.2007. Wadi Shawkah, 1♂, 3.iii.2007; 1♂, 1♀, 5.iii.2007. All leg. BM & PF.

Distribution: North and Central Africa, S Italy (islets of the Sicilian Channel), Middle East, including the UAE.

Schistocerca gregaria (Forskål, 1775)

Specimens examined: Sharjah Desert Park, 1♂, 6–28.xii.2006, LT, leg. A. van Harten.

Distribution: Widespread in Africa and Asia.



Plates 21–22. *Chrotogonus homalodemus homalodemus* (Blanchard). 21: Female from Wadi Shawkah, dorsally; 22: Female from E of Mahafiz, ventral pattern.



Plates 23–24. *Chrotogonus homalodemus homalodemus* (Blanchard), from Wadi Shawkah. 23: Male; 24: Male and female in copulation.

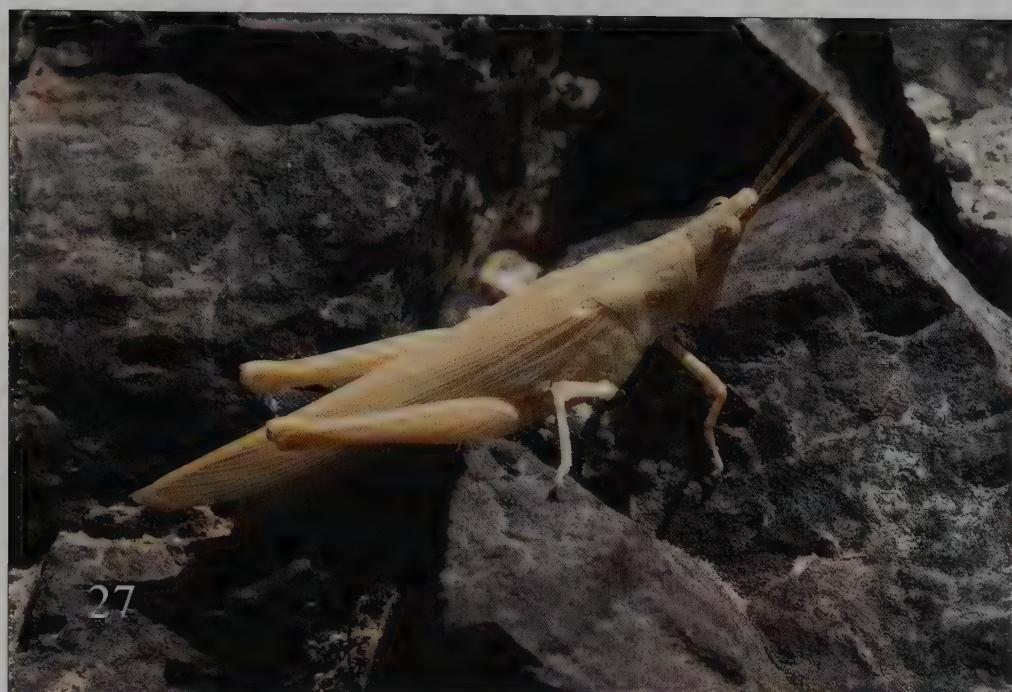


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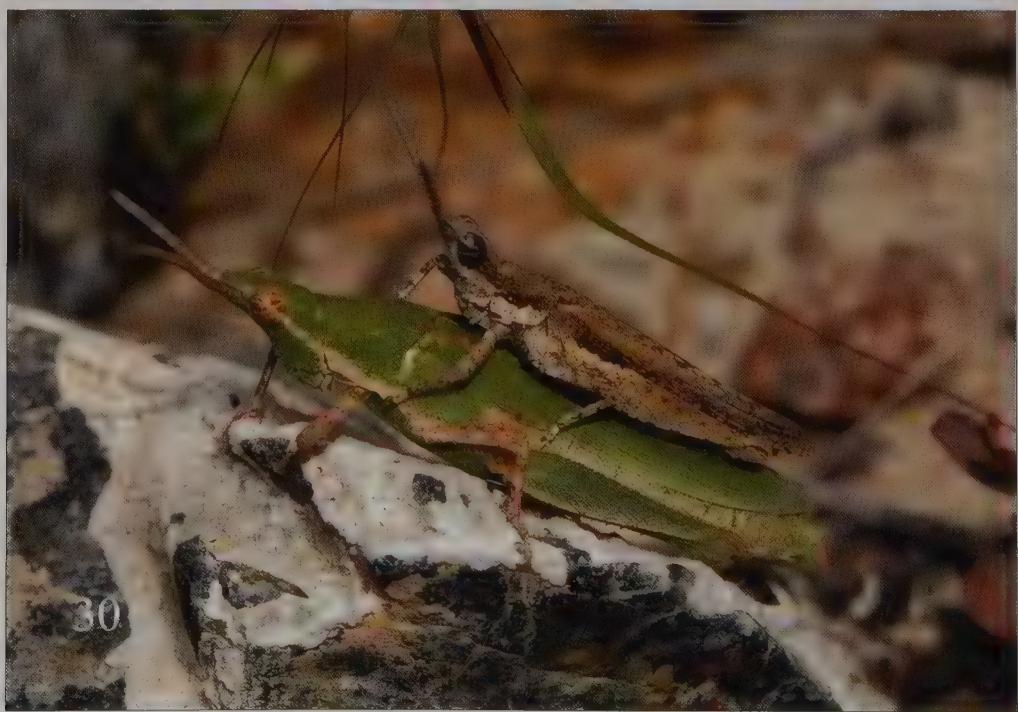


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Plates 25–26. *Pyrgomorpha conica tereticornis* (Brullé). 25: Brown female from Khor Kalba road, near tunnel; 26: Green female from 7 km S of al-Jazirat al-Hamra.



Plates 27–28. *Pyrgomorpha conica tereticornis* (Brullé). 27: Yellowish female from Wadi Shawkah; 28: Grey male from al-Ajban.



Plates 29–30. *Pyrgomorpha conica tereticornis* (Brullé). 29: Yellowish male from Wadi Shawkah; 30: Brown male and green female, copulating.



Plates 31–32. *Tenuitarsus angustus* (Blanchard). 31: Female from Um al-Quwain; 32: Male from al-Samha.

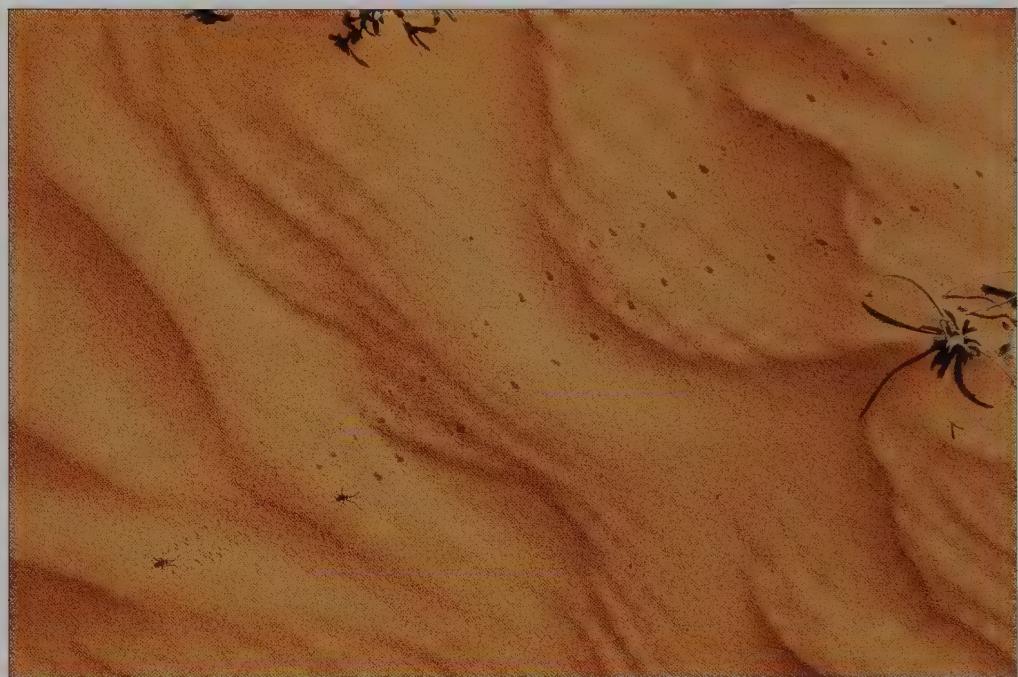


Plate 33. Jumping tracks of *Tenuitarsus angustus* (Blanchard), Um al-Quwain.

***Diabolocatantops axillaris* (Thunberg, 1815)**

Plates 37–38

Specimens examined: Masafi-Dibba road, 2♀, 12.iii.2007, leg. BM & PF.

Distribution: Africa (between 10° and 20°N), E Africa, Arabian Peninsula and S Iran.

***Duroniella parallella* Uvarov, 1950**

Plates 39–41

Specimens examined: Dibba, 7♂, 12.iii.2007, leg. BM & PF. Fujairah, 1♂, 6.iii.2007, leg. BM & PF. Khor Kalba, 5♂, 4.iii.2007, leg. BM & PF. N of Ra's al-Khaimah, 4♂, 1♀, 12.iii.2007, leg. BM & PF. Wadi Shawkah, 3♂, 4♀, 3.iii.2007, leg. BM & PF.

Distribution: Described from Oman, also recorded from the UAE.

***Locusta migratoria migratoria* (Linnaeus, 1758)**

Plate 42

Specimens examined: E of Sharjah, 2♂, 5.iii.2007, leg. BM & PF.

Distribution: Widespread in Africa, Asia and Europe.

***Sphingonotus femoralis* Uvarov, 1933**

Plates 43–44

Specimens examined: Khor Kalba, 1♂, 1♀, 4.iii.2007, leg. BM & PF. Near Masafi, 1♂, 1♀, 11.iii.2007, leg. BM & PF. Wadi Safad, 1♂, 6.iii.2007, leg. BM & PF.

Distribution: Occurring in the Middle East, the Arabian Peninsula, NE Africa and the Horn of Africa.

***Sphingonotus octofasciatus* (Serville, 1838)**

Plates 45–46

Specimens examined: Near Masafi, 1♂, 11.iii.2007, leg. BM & PF. Wadi Maidaq, 3♂, 7.iii.2007, leg. BM & PF.

Distribution: Occurring from Algeria to Egypt, Middle East and C Asia.



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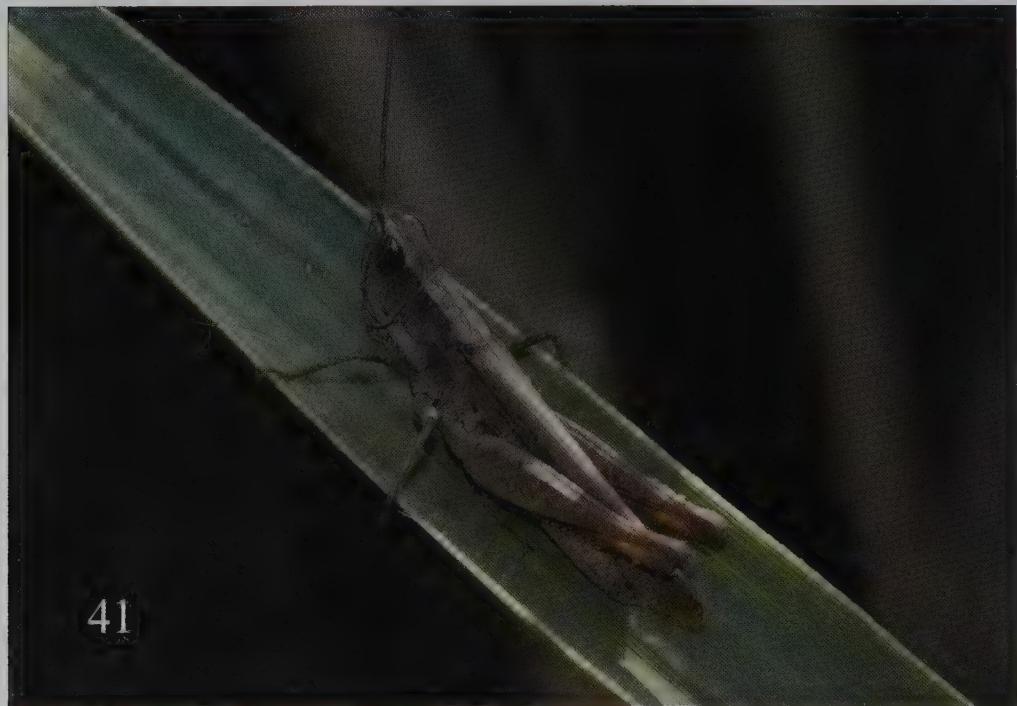
Plates 34–35. *Heteracris annulosa annulosa* Walker. 34: Female from Khor Kalba mangroves; 35: Male from Wadi Safad.



Plates 36–37. 36: *Heteracris annulosa annulosa* Walker, grey male from 7 km S of al-Jazirat al-Hamra; 37: *Diabolocatantops axillaris* (Thunberg), female from Masafi-Dibba road.



Plates 38–39. *Duroniella parallelia* Uvarov. 38: Brown female; 39: Green female. Both from Wadi Shawkah.



Plates 40–41. *Duroniella parallelella* Uvarov. 40: Male from Wadi Shawkah; 41: Grey male from N of Ra's al-Khaimah.



Plate 42. *Locusta migratoria migratoria* (Linnaeus), male from E of Mahafiz.

***Sphingonotus rubescens rubescens* (Walker, 1870)**

Plates 47–49

Specimens examined: Dibba, 3♂, 1♀, 12.iii.2007. Masafi, 4♂, 3♀, 6.iii.2007. Near Masafi, 17♂, 8♀, 11.iii.2007. N of Ra's al-Khaimah, 1♀, 12.iii.2007. Wadi Bih dam, 12♂, 11♀, 8.iii.2007. Wadi Midaq, 9♂, 7♀, 7.iii.2007. Wadi Shawkah, 2♂, 3♀, 5.iii.2007. All leg. BM & PF.

Distribution: Widespread from the Canary Islands throughout N Africa, S Europe, Middle East, Asia Minor to Central Asia.

***Acrotylus insubricus* (Scopoli, 1786)**

Plates 50–51

Specimens examined: Wadi Midaq, 1♂, 3♀, 7.iii.2007, leg. BM & PF. Wadi Bih dam, 1♀, 8.i.2007, leg. BM & PF. Khor Kalba road, 2♀, 4.i.2007, leg. BM & PF. Wadi Shawkah, 8♂, 3♀, 5.i.2007, leg. BM & PF.

Remarks: Recorded from the UAE under its synonym *Acrotylus insubricus inficitus* (Walker, 1870) by Popov (1980), Gillett (2000), Gillett & Howarth (2004) and van Harten (2005).

Distribution: S Europe, SW Asia, much of Africa and Arabia (Ingrisch, 1999).

***Acrotylus longipes* (Charpentier, 1843)**

Plate 52

Specimens examined: Masafi, 1♀, 6.i.2007, leg. BM & PF. Al-Samha, NE of Abu Dhabi, 1♀, 10.i.2007, leg. BM & PF. Um al-Quwain, 2♂, 4♀, 8.i.2007; 4♂, 5♀, 11.i.2007, leg. BM & PF.

Distribution: S Crimea, Ukraine, Carpathian Mountains, former Yugoslavia, Greece, Italy, S Spain, Africa and Middle East.



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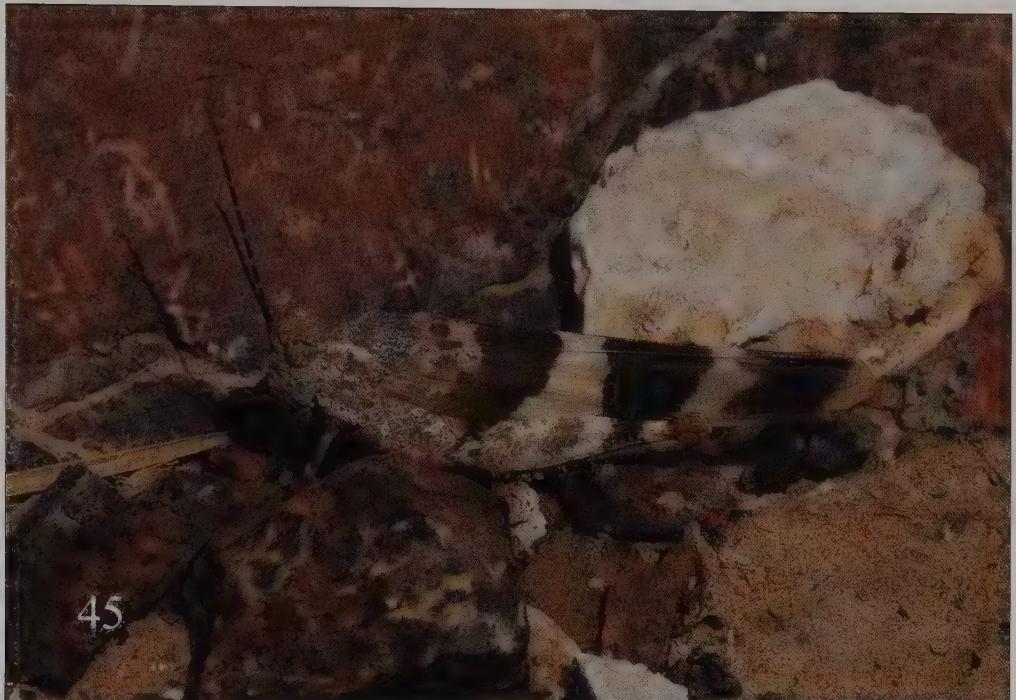
Plates 43–44. *Sphingonotus femoralis* Uvarov. 43: Brown male from al-Samha; 44: Grey male from Khor Kalba road, near tunnel.

Truxalis fitzgeraldi Dirsh, 1950

Material examined: Al-Ajban, 2♀, 10.iii.2007, leg. BM & PF. Khor Kalba, 1♂, 1♀, 4.iii.2007, leg. BM & PF. E of Sharjah, 1♂, 1♀, 5.iii.2007, leg. BM & PF. Wadi Safad, 2♂, 2♀, 6.iii.2007, leg. BM & PF. Wadi Shawkah, 1♂, 5.iii.2007, leg. BM & PF.

Distribution: Known from Iran and the Arabian Peninsula.

Plates 53–57



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Plates 45–46. *Sphingonotus octofasciatus* (Serville). 45: Female; 46: Male. Both from Wadi Midaq.



Plates 47–48. *Sphingonotus rubescens rubescens* (Walker). 47: Female; 48: Male. Both from Wadi Bih dam.



Plates 49–50. 49: *Sphingonotus rubescens rubescens* (Walker), male and female courtship, Wadi Bih dam; 50: *Acrotylus insubricus* (Scopoli), female from Khor Kalba road, near tunnel.



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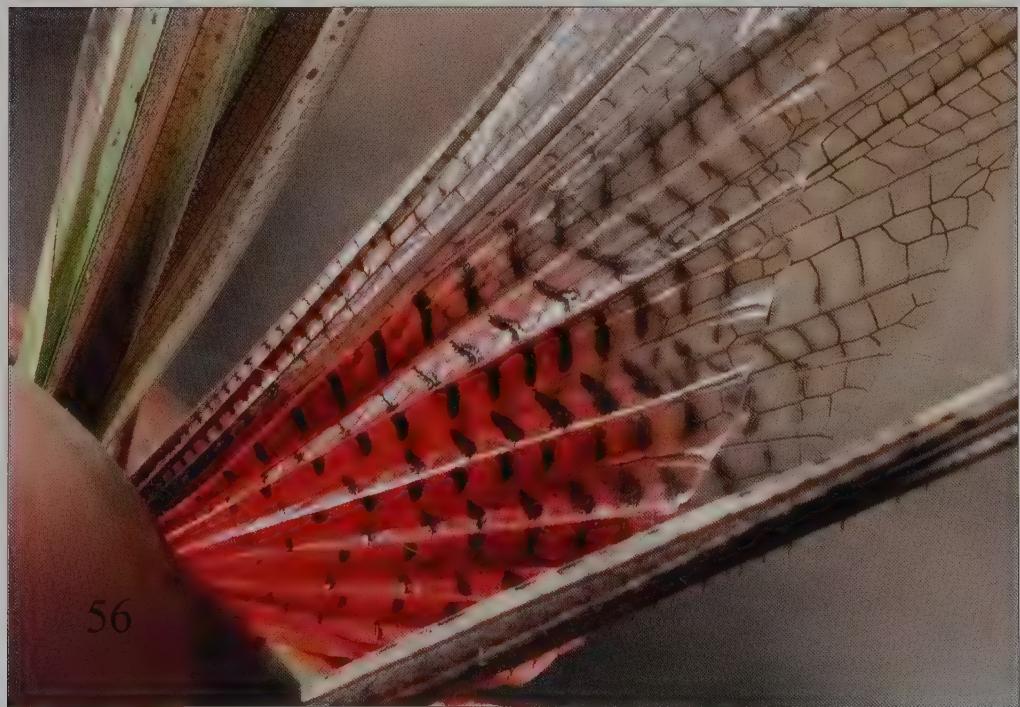
Plates 51–52. 51: *Acrotylus insubricus* (Scopoli), male from Wadi Shawkah; 52: *Acrotylus longipes* (Charpentier), male from Um al-Quwain.



Plates 53–54. *Truxalis fitzgeraldi* Dirsh. 53: Green female from Khor Kalba road, near tunnel; 54: Brown male from Wadi Safad.



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Plates 55–56. *Truxalis fitzgeraldi* Dirsh. 55: Green-brown male from Wadi Shawkah; 56: Wing pattern of male from Wadi Shawkah.



Plate 57. *Truxalis fitzgeraldi* Dirsh, nymph from Khor Kalba road, near tunnel.

***Aiolopus thalassinus thalassinus* (Fabricius, 1781)**

Plates 58–59

Material examined: Al-Ajban, 5♂, 9♀, 10.iii.2007. Dibba, 1♀, 12.iii.2007. Khor Kalba, 6♂, 7♀, 4.iii.2007. Khor Kalba road, 4♂, 2♀, 4.iii.2007. E of Mahafiz, 2♂, 5♀, 5.iii./2007. Wadi Bahai, 3♀, 8.iii.2007. Wadi Maidaq, 6♂, 7♀, 7.iii.2007. Wadi Shawkah, 1♂, 2♀, 5.iii.2007.

Distribution: Occurs in Europe, Africa, Central and SW Asia, India and Arabia.

***Ochrilidia geniculata* (Bolivar, 1913)**

Plates 60–61

Material examined: Wadi Maidaq, 6♂, 5♀, 7.iii.2007, leg. BM & PF.

Distribution: Widespread in N and E Africa, Middle East, India and the Arabian Peninsula.

***Ochrilidia persica* (Salfi, 1931)**

Previously recorded by Tigar & Osborne (1999) from Abu Dhabi Emirate. This species occurs in E Africa and the Middle East; its presence in the UAE should be confirmed (see next species).

***Ochrilidia tibialis* (Fieber, 1853)**

The record by Gillett (2000) is unlikely. *O. tibialis* is a Greek species. Following the species key to species of Jago (1977), all *Ochrilidia* with not much flattened antennal segments should belong to *O. tibialis* (Fieber), but Mistshenko (1986) considers that at least seven species listed by Jago (1977) as synonyms of *O. tibialis* have to be considered as valid species; among them *O. filicornis* (Krauss, 1902), a species widespread in North Africa and the Middle East (cf. also Harz, 1975).



Plates 58–59. *Aiolopus thalassinus thalassinus* (Fabricius). 58: Greenish female; 59: Reddish female. Both from Wadi Midaq.



Plate 60–61. *Ochrilidia geniculata* (Bolívar). 60: Female from Wadi Maidaq; 61: Male from Wadi Shawkah.

***Stenohippus mundus* (Walker, 1871)**

Plates 62–63

Specimens examined: Khor Kalba, 4♂, 1♀, 4.iii.2007, leg. BM & PF. Near Masafi, 1♂, 1♀, 11.iii.2007. leg. BM & PF. E of Sharjah, 1♂, 5.iii.2007, leg. BM & PF. Wadi Bahai, 1♂, 8.iii.2007, leg. BM & PF. Wadi Maidaq, 6♂, 1♀, 7.iii.2007, leg. BM & PF. Wadi Shawkah, 11♂, 2♀, 5.iii.2007, leg. BM & PF.

Remarks: Doubtfully quoted from al-Ain by Gillett (2000).

Distribution: Described from India, recorded from several countries of Africa and Middle East, the Arabian Peninsula included.



Plates 62–63. *Stenohippus mundus* (Walker). 62: Female; 63: Male. Both from Khor Kalba road, near tunnel.



Plate 64. Mimetism of a grasshopper (*Temuitarsus angustus* (Blanchard)) in the desert.

CONCLUSIONS

Orthoptera are not readily collected in insect traps and an inventory attempt of this group should better be carried out by netting specimens during field trips. The stay of B. Massa and P. Fontana resulted in a number of species being captured that before had not been collected from the UAE, including two species that might turn out to be new to science. However, the trip was too short to enable a more complete picture of the orthopteran fauna of the country. Orthoptera are well adapted to desert habitats (see Plate 64) and quite a number of further species will occur. Further collecting trips by specialists are therefore recommended.

ACKNOWLEDGEMENTS

We express our gratitude to Antonius van Harten for involving us in his project, making available the material collected by him, and for his kind hospitality during the stay of P. Fontana and B. Massa in the UAE. We also thank Khalid Mahmood, who very efficiently accompanied B.M. and P.F. to collect in the best habitats of the country. We thank Dr. Andrej Gorochov (Russian Academy of Sciences) and Dr. George Beccaloni (Natural History Museum, London) for the hospitality given to F.M. Buzzetti during June 2008.

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Annex 1. List of Orthoptera recorded from the UAE

1 2 3 4 5 6 7 8 9 10 11 12 13

Family Tettigoniidae

<i>Conocephalus concolor</i> (Burmeister, 1838)	.	.	.	.	.	.	.	x	.	.	.	.
<i>Conocephalus maculatus</i> (Le Guillou, 1841)	.	.	.	.	.	.	.	.	.	.	.	x
<i>Diogena fausta</i> (Burmeister, 1838)	.	.	.	.	.	.	.	x	.	.	.	.
<i>Phaneroptera sparsa</i> Stål, 1856	.	.	.	.	.	.	.	x	.	.	.	.
<i>Trigonocorypha angustata</i> Uvarov, 1922	.	x	.	.	.	.	.	.	.	.	x	x
<i>Decticus albifrons</i> (Fabricius, 1775)	.	x	.	.	.	.	.	.	.	.	.	.

Family Gryllidae

<i>Acheta confalonierii</i> (Capra, 1929)	.	.	.	.	.	.	.	.	.	.	.	x
<i>Acheta</i> cf. <i>arabica</i> Gorochov, 1993	.	.	.	.	.	.	.	.	.	.	x	.
<i>Acheta domesticus</i> (Linnaeus, 1758)	.	x	.	x	.	.	.	.	.	x	.	.
<i>Acheta</i> spec.	.	.	.	.	.	.	.	.	.	.	x	.
<i>Gryllodes supplicans</i> (Walker, 1859)	.	.	.	.	.	.	.	.	.	x	.	.
<i>Gryllopsis</i> spec.	.	.	.	.	.	.	.	.	.	x	.	.
<i>Gryllus bimaculatus</i> DeGeer, 1773	.	.	x	.	x	.	.	.	.	x	x	.
<i>Trigonidium cicindeloides</i> Rambur, 1839	.	.	.	.	.	.	.	.	.	.	x	.

Family Gryllotalpidae

<i>Gryllotalpa africana</i> Palisot de Beauvois, 1805	.	.	.	.	.	.	.	x?	.	.	.	.
<i>Gryllotalpa debilis</i> Gerstäcker, 1869	.	.	.	.	x	.	.	.	.	x	.	.
<i>Gryllotalpa stepposa</i> (Zhantiev, 1991)	.	.	.	.	.	.	.	.	x?	.	.	.
<i>Gryllotalpa gryllotalpa</i> (Linnaeus, 1758)	.	.	.	.	.	.	.	.	x?	.	.	.

Family Tetrigidae

<i>Euparatettix histrionicus</i> (Stål, 1861)	.	.	x	.	.	.	.	.	.	x	.	.
<i>Hedotettix alienus</i> Uvarov, 1936	.	.	.	.	.	.	.	.	.	x	.	.

Family Trydactylidae

<i>Asiotridactylus fasciatus</i> (Guérin-Méneville, 1829)	.	.	.	.	.	x	.	.	.	x	.	x
<i>Xya</i> spec.	.	.	.	.	.	.	.	.	.	x	.	.

Family Pyrgomorphidae

<i>Chrotogonus homalodemus</i> (Blanchard, 1836)	x	.	.	.	.	x	.	x	.	x	x	x
<i>Pyrgomorpha cognata minima</i> Uvarov, 1943	.	.	.	.	.	.	.	x?	.	x?	.	.
<i>Pyrgomorpha conica tereticornis</i> (Brullé, 1840)	x	.	x	.	x	.	x	x	.	x	x	.
<i>Tenuitarsus angustus</i> (Blanchard, 1836)	x	.	.	.	x	x	x	.	.	x	.	.

Family Acrididae

<i>Acorypha glaucopsis</i> (Walker, 1870)	x	x x . . .
<i>Heteracris adspersa adspersa</i> (Redtenbacher, 1889)	x	x
<i>Heteracris annulosa annulosa</i> Walker, 1870	x	x x x . . x
<i>Heteracris littoralis</i> (Rambur, 1838)	x . x . . .	x x x . .
<i>Dericorys albidula</i> Serville, 1838	x	x
<i>Dericorys cyrtosterna</i> Uvarov, 1933	x	x x . . .
<i>Schistocerca gregaria</i> (Forskål, 1775)	. . x x . . .	x . . x x
<i>Anacridium aegyptium</i> (Linnaeus, 1764)	. . . . .	x
<i>Anacridium melanhorodon arabafrum</i> Dirsh, 1953	x . . x . . .	x
<i>Diabolocatantops axillaris</i> (Thunberg, 1815)	x . . x . . .	x x
<i>Duroniella laeviceps</i> Uvarov, 1938	. . . . .	x
<i>Duroniella parallelia</i> Uvarov, 1950	x	x x
<i>Hilethera aelopoides</i> (Uvarov, 1922)	x	x
<i>Scintharista notabilis blanchardiana</i> (Saussure, 1888)	x	x . . x .
<i>Oedaleus senegalensis</i> (Krauss, 1877)	x	x
<i>Locusta migratoria migratoria</i> (Linnaeus, 1758)	. . . x x . . .	x . x . x
<i>Morphacris fasciata</i> (Thunberg, 1815)	. . x . . . .	. . . . .
<i>Hyalorrhapis canescens</i> (Saussure, 1888)	x	x
<i>Leptopternis gracilis</i> (Eversmann, 1848)	. . . . .	x
<i>Sphingonotus femoralis</i> Uvarov, 1933	x	x x
<i>Sphingonotus lavandulus</i> Popov, 1980	x	x
<i>Sphingonotus octofasciatus</i> (Serville, 1838)	x	x x
<i>Sphingonotus rubescens rubescens</i> (Walker, 1870)	x . x . x . . .	x . . x x
<i>Sphingonotus dentatus</i> (Predtetchensky, 1936)	x	x
<i>Sphingonotus paradoxus</i> (Bei-Bienko, 1948)	x	x
<i>Sphingonotus savignyi</i> (Saussure, 1884)	x . . x . x . . .	x . . x .
<i>Eusphingoderus predtetchenskyi</i> (Mistshenko, 1936)	x	x
<i>Acrotylus insubricus</i> (Scopoli, 1786)	x	x . . x x
<i>Acrotylus longipes</i> (Charpentier, 1843)	x	x . . . x
<i>Mioscirtus wagneri rogenhoferi</i> (Saussure 1888)	x	x . . . x
<i>Truxalis eximia eximia</i> Eichwald, 1830	x	x
<i>Truxalis fitzgeraldi</i> Dirsh, 1950	x	x x
<i>Truxalis longicornis</i> (Krauss, 1902)	. . . . .	x . . . x .
<i>Truxalis procera</i> Klug, 1830	x . x . x . . .	x . . x .
<i>Aiolopus simulatrix simulatrix</i> (Walker, 1870)	. . . . .	x
<i>Aiolopus thalassinus thalassinus</i> (Fabricius, 1781)	x . x . x . . .	x . . x x
<i>Ochrilidia geniculata</i> (Bolivar, 1913)	x	x x . . x x
<i>Ochrilidia pachypes</i> Chopard, 1950	. . . . .	x
<i>Ochrilidia persica</i> (Salfi, 1931)	. . . . .	x?
<i>Ochrilidia tibialis</i> (Fieber, 1853)	. . . . .	x?
<i>Leva arabica</i> (Uvarov, 1936)	x	x
<i>Stenohippus mundus</i> (Walker, 1871)	. . . . .	x? . . . x

[1 = Popov, 1980; 2 = Popov, 1981; 3 = Walker & Pittaway, 1987; 4 = Gassouma, 1991; 5 = Wingate, 1992; 6 = Gorochov, 1993; 7 = Popov, 1997; 8 = Tigar & Osborne, 1999; 9 = Gillett, 2000; 10 = Gillett & Gillett, 2002; 11 = Gassouma, 2003; 12 = Gillett & Howarth, 2004; 13 = Present chapter. x? = Doubtful record]

Order Hemiptera

Key to families of Auchenorrhyncha from the Arabian Peninsula

Michael R. Wilson & James Turner

INTRODUCTION

The Hemiptera is the largest exopterygote groups of insects with over 80,000 described species. They may be recognized by the particular structure of the mouthparts, being modified into concentric stylets, the mandibular enclosing the maxillary ones and together forming the food and salivary channels. They are a very diverse group comprising scale insects, aphids, psyllids and whiteflies (*Sternorrhyncha*), true bugs (*Heteroptera*) and the Auchenorrhyncha (leafhoppers, planthoppers, treehoppers, spittlebugs and cicadas). Hemiptera feeding habits range from phytophagy to predation, including ectoparasitism and haematophagy. Many of them are important pest species of cultivated crops and some are important vectors of human diseases. Forero (2008) provides a useful review and summary of the phylogeny of the Hemiptera. Papers in Nault & Rodriguez (1985) provide good introductions to groups and topics.

The Auchenorrhyncha has been traditionally divided in two main groups, Cicadomorpha (leafhoppers, treehoppers, spittlebugs) and Fulgoromorpha (the planthopper families). They are all plant feeding, either from phloem, xylem vessels or mesophyll tissue. Some are important pests of crop plants either by direct feeding or by spreading virus and phytoplasma diseases.

Auchenorrhyncha, especially Cicadellidae (leafhoppers) may be very common in many habitats, particularly in grasslands. Given the arid nature of much of the Arabian Peninsula the numbers of species appears to be relatively low. Few comprehensive studies have been made so far, with the exception of contributions by Dlabola for Saudi Arabia (1979, 1980, 1987). Linnauvori in several papers added species to the Arabian fauna (e.g. Linnauvori, 1973, 1989). For that country there are around 130 species of Auchenorrhyncha recorded. However, taken as a whole there are small numbers of species across a wide range of families; 13 out of 21 planthopper (Fulgoromorpha) families have been noted so far. The Cicadidae of the UAE have been studied by Schedl (2007). Gassouma (1991, 2003) dealt with a few agricultural pest species of the families Cicadellidae, Delphacidae and Tropiduchidae in the UAE.

This introduction to the Auchenorrhyncha of the Arabian Peninsula attempts to provide a key to the families known to be present and some expected to be found. Detailed studies on each family found in the UAE will be prepared as more samples become available and further studied.

Keys to families

- 1 Pedicel of antenna not broader than scape; tegulae never present **Cicadomorpha** (leafhoppers, treehoppers, spittlebugs, cicadas) [see separate key]
- 2 Pedicel of antenna broader than scape, bearing wart-like sensilla (e.g. Plate 12); Tegula nearly always present on thorax at base of wing (e.g. Plate 24) **Fulgoromorpha** (planthopper families) [see separate key]



Plates 1–6. 1: Head of cicada to show 3 ocelli on head; 2: Hind leg of Lophopidae to show spines absent on second tarsal segment; 3: Hind leg of cercopid to show pre-apical spines; 4: Hind leg of cicadellid to show rows of small spines; 5: Hind leg of Dictyopharidae to show row of spines on second tarsal segment; 6: Hind leg of Tropiduchidae to show apical spines on each lateral margin of the second tarsal segment.

Key to Cicadomorpha

- 1** Head with three ocelli arranged in triangle on crown (Plate 1) **Cicadidae**
- Head with two ocelli, variously positioned, or ocelli absent **2**

- 2 Hind coxa conical; hind tibia cylindrical, often with one or more large preapical spines (Plate 3), but never with rows of enlarged setae; ocelli on crown; body and wing surfaces clothed with fine setae (Cercopoidea) 3
- Hind coxa transverse; tibia quadrate, usually with conspicuous longitudinal rows of enlarged setae (Plate 4); ocelli variously positioned; body and wings without a conspicuous vestiture of fine setae (Membracoidea) 4
- 3 Eye depressed and oblong, distinctly wider than high, less than half its width from forewing base. Frontoclypeus convex throughout; eye not reaching forewing base. Hind margin of pronotum W-shaped **Aphrophoridae** (Plate 7) [*Poophilus* spec.]
- Eye globular, no wider than high, usually more than its width from forewing base. Hind margin of pronotum not W-shaped **Cercopidae**
- 4 Pronotum not extended over scutellum. Hind tibia with setae of longitudinal rows usually large and conspicuous. Wings variously developed **Cicadellidae** (e.g. Plates 8–10)
- Pronotum extended posteriorly over and often largely or entirely concealing scutellum or, if scutellum completely exposed, then scutellum with distinct median posterior groove or emargination. Hind tibia with setae of longitudinal rows small and inconspicuous **Membracidae** (Plate 13) [*Leptocentrus* spec.]

Key to Fulgoromorpha

- 1 Hind tibia with movable spur (Plate 16) **Delphacidae** (e.g. Plates 11–12)
- Hind tibia without a spur but with other arrangements of smaller spines 2
- 2 Second segment of hind tarsi with row of apical spines (Plate 5) 3
- Second segment of hind tarsi with an apical spine on each lateral margin (Plate 6) or spines absent (Plate 2) 9
- 3 Apical and hind areas of hindwings with many cross veins **Fulgoridae** (Plate 14)
- Apical areas of hindwing without cross veins 4
- 4 Forewings with apices overlapping when at rest (Plate 20) **Achilidae**
- Forewings without apices overlapping 5
- 5 One or both claval veins tuberculate; apical segment of rostrum longer than wide **Meenoplidae** (Plate 15)
- Claval veins not tuberculate 6
- 6 Apical segment of rostrum as wide as long (Plate 17) **Derbidae** (Plate 21)
- Apical segment of rostrum longer than wide 7
- 7 Cephalic projection present but if not present then face with 2 or 3 median carina (Plate 18) [Tegulae absent in Orgeriini] **Dictyopharidae** (Plate 22)
- Cephalic projection usually absent. Face with 1 median carina (e.g. Plate 19) 8
- 8 Forewing with veins usually bearing setae in tubercles. Ovipositor often long and sword shaped **Cixiidae** (Plate 23)
- Forewing with veins not tuberculate and lacking setae. External genitalia reduced in female **Kinnariidae** (Plate 24)
- 9 Second hind tarsal segment with a spine at each side (Plate 6) 10
- Second hind tarsal segment often small and without spines (Plate 2) 15
- 10 Compound eyes not separated from frons by strong lateral carinae, lateral ocelli visible in frontal view **Tettigometridae** (Plate 25)
- Compound eyes separated from frons by strong lateral carinae, lateral ocelli not visible in frontal view 11



7



8



9



10

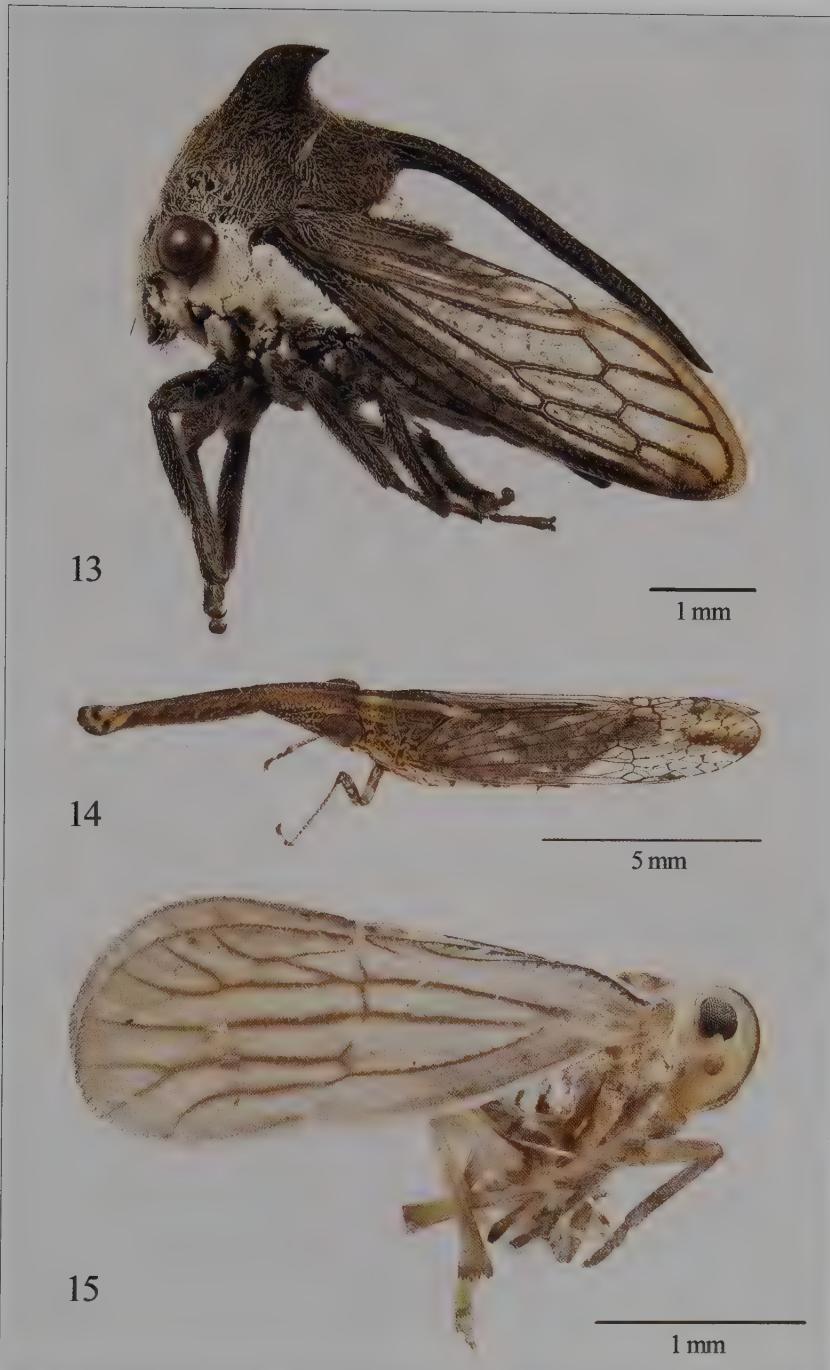


11



12

Plates 7–12. 7: Aphrophoridae, *Poophilus* sp.; 8: Cicadellidae, *Balclutha* sp.; 9: Cicadellidae, *Austroagallia* sp.; 10: Cicadellidae, *Exitanus* sp.; 11: Delphacidae, *Peregrinus maidis* (Ashmead); 12: Delphacidae, *Leptodelphax* sp.



Plates 13–15. 13: Membracidae, *Leptocentrus* sp.; 14: Fulgoridae, *Dorysarthrus* sp.; 15: Meenoplidae, *Nisia nervosa* (Motschulsky)

- 11** Mesonotum usually with posterior angle separated by transverse suture **Tropiduchidae** (Plate 26)
- Mesonotum without transverse suture **12**
- 12** Clavus with many prominent tubercles (Plate 28), fore wings usually opaque **Flatidae** (Plate 32)
- Clavus without tubercles **13**
- 13** Paradiscal fields of pronotum (lateral parts of pronotum behind the eyes) comparatively long **14**
- Paradiscal fields of pronotum comparatively short **Caliscelidae** (Plate 27) (only Adenissini)
- 14** Fore wing and hind wing well developed. Anterior margin of pronotum exceeding level of middle of eye, clypeus usually carinate. Gonoplacs flattened laterally, elongate. Anterior connective lamina of gonapophyse VIII narrow and long. Style without lateral tooth **Nogodinidae** (Plate 29) [*Philbyella* spec.]
- Fore wing brachypterous and hind wing may be absent or reduced in size. Gonoplacs convex, rounded. Anterior connective lamina of gonapophyse VIII wide. Style with lateral tooth **Issidae** (Plate 28)
- 15** Claval suture extending almost to apex of fore wing; fore wing often with apical margin as broad or broader than length of anal margin; no wax production if female (Plate 33) .. **Ricaniidae**
- Claval suture not extending to apex of fore wing, fore wing with apical margin shorter than anal margin. Wax production in female **16**
- 16** Vertex, narrow, width less than 3 times length at midline. Clypeus with lateral carinae, frons usually longer than wide (Plate 30) **Lophopidae**
- Vertex wide, three times wider in mid line than length. Clypeus without lateral carinae, frons wider than long (Plate 31) **Eurybrachidae**

Notes on families found in the UAE

CICADOMORPHA

Cicadidae (cicadas)

Cicadas are usually large insects, all have three prominent ocelli on the vertex which as well as the large size serves to separate them from other Auchenorrhyncha. The nymphal stages of Cicadidae feed from xylem tissue from roots of their host plants. Schedl (2007) has covered the two species found in the UAE.

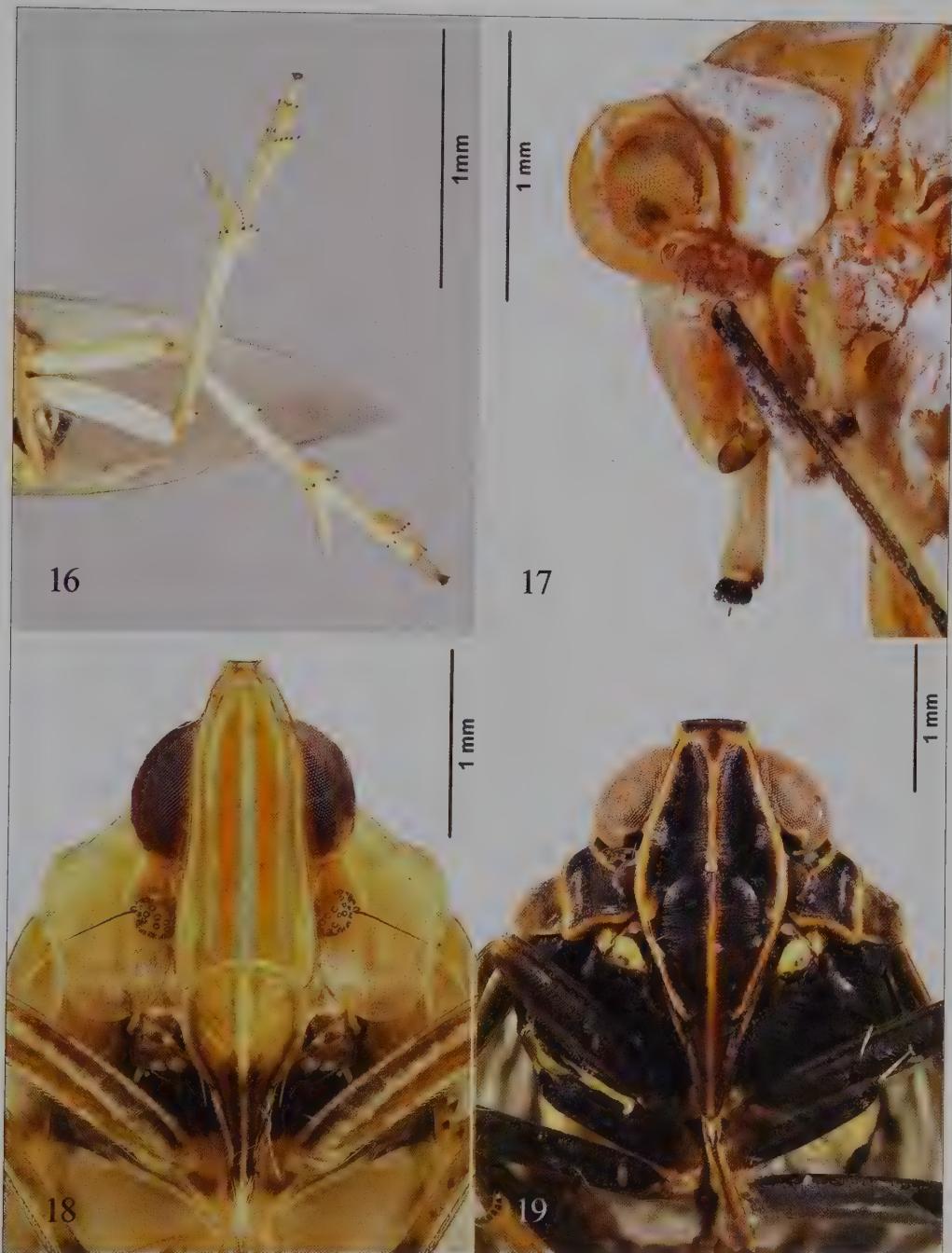
Cicadellidae (leafhoppers)

In the UAE the Cicadellidae are the most numerous both in numbers of individuals and species (for examples see Plates 8–10). Perhaps 50 species in 6 subfamilies will be present.

Membracidae (treehoppers)

In the UAE one species of Membracidae, *Leptocentrus* spec. (Plate 13) has been noted to date.

FULGOROMORPHA



Plates 16–19. 16: Hind leg of Delphacidae showing tibial spur; 17: Derbidae, globular apical segment of rostrum; 18: Dictyopharidae, face showing carinae; 19: Cixiidae: face showing one median carina.



Plates 20–25. 20: Achilidae, *Akotropis* spec.; 21: Derbidae, *Diostrombus* spec.; 22: Dictyopharidae, *Dictyophara* spec.; 23: Cixiidae, *Reptalus* spec.; 24: Kinnaridae, *Perloma* spec.; 25: Tettigometridae, *Tettigometra obliqua* (Panzer).

Achilidae

Achilids may usually be identified by the forewings overlapping at the apex. They are usually pale brown in colour but some are brightly patterned. There are around 250 described world species, mostly in the tropics and subtropics. One species of *Akotropis* Matsumura, 1914 (Plate 20) has been noted in the UAE.

Caliscelidae

The Caliscelidae is a small family related to the Issidae, from which it has recently been removed to family status. Some species resemble issid species, in being ‘coleopterous’ and have short forewings, reduced hindwings and being flightless. Together with issids they are often found in arid areas. Being flightless they will not be present in light trap samples and only occasionally in Malaise traps.

Cixiidae

Cixiids are one of the larger of the planthopper families; at least 1000 species have been described. They may be recognised by a combination of characters, including the membranous fore wings with tubercles with small setae along the veins. Nymphal stages are found underground, where they feed from phloem tissue of their host plants. As adults they feed on a wide range of host plants but individual species may be restricted to certain habitats. A few species are known to be vectors of phytoplasma disease. They range in size from 4–10 mm.

Delphacidae

Delphacids may be recognised by the possession of a hind tibial spur (Plate 16), a character found in no other family. They are usually small insects, under 5 mm in length. Many species are associated with feeding on Poaceae, and most are specific to a narrow range of host plants. Some species have two wing forms, brachypterous, which cannot fly, and fully winged macropterous forms, which may disperse widely. There are at least 2000 described species, with many more to be described from little known areas such as the Afrotropical region.

Derbidae

The derbids are a very diverse family, over 800 species have been described, with forms with very long forewings and short hindwings as well as those species with shorter wings. Many can be recognised by having a very short, globular, apical segment to the rostrum. Two species of the genus *Diostrombus* Uhler, 1896 (Plate 21) have been recorded in the Arabian Peninsula.

Dictyopharidae

Dictyopharidae may be difficult to characterise, but the common species in the UAE are relatively large insects, with an elongated head process. (e.g. *Dictyophara* spec., Plate 22). It is likely that the brachypterous Orgerini will also be present, living on the ground vegetation. The superficially similar genus *Dorysarthrus* Puton, 1895, has been transferred to Fulgoridae (Emeljanov, 1979).

Eurybrachidae

Eurybrachidae may be distinguished by the broad head and short body, and are often brightly coloured. Over 200 species have been described and one species, *Neoplatybrachys orientalis* Lallemand, 1950 (Plate 31) is known from Yemen (Constant, 2005).

Flatidae

Many Flatidae have large tent-like forewings, which are often brightly coloured and have numerous parallel cross veins on the costal margin and distinct tubercles on the clavus. The second tarsal segment has only a single spine on each side. Over 1000 species have been described. Several genera have been recorded from the Arabian Peninsula (e.g. Dlabola, 1980), including *Phantia* Fieber, 1866 (Plate 32), known from the UAE.



Plates 26–31. 26: Tropiduchidae, *Ommatissus lybicus* Bergevin; 27: Caliscelidae, *Adenissus* spec.; 28: Issidae, *Kovacsiana* spec.; 29: Nogodinidae, *Philbyella* spec.; 30: Lophopidae, *Lophops pallida* Melichar, 1902; 31: Eurybrachidae, *Neoplatybrachys orientalis* Lallemand.

Fulgoridae

Many tropical Fulgoridae are very brightly coloured large insects, often sitting on the trunks of forest trees. The genus *Omalocephala* Spinola, 1839, is known from the Arabian Peninsula, while *Dorysarthrus* (Plate 14) with its distinctive very long apical process is known from the UAE.

Issidae

In the western Palaearctic the issid fauna is known from over 400 species, all of which are

flightless, and many living in arid areas, some may also have a limited distribution. There are over 1000 species described worldwide and many remain to be described. The taxonomy and faunistics of the family is under study by Vladimir Gnezdilov (Zoological Institute, St Petersburg, Russia). Like Caliscelidae, being flightless they are under-represented in trap samples.

Kinnaridae

The Kinnaridae, with around 80 species currently described, are recognised in both the Old and New World, predominantly from the tropics and subtropics. The discovery in the UAE of three species in the genus *Perloma* Emeljanov, 1984 (Plate 24) is remarkable, since the genus is only known by a few species based on a small number of specimens (see Wilson, 2010a, this volume).

Lophopidae

The Lophopidae is a small family, with the majority of species confined to the Old World tropics. The absence of spines on the second tarsal segment and the long narrow vertex assists in their identification. One species has been found in the Arabian Peninsula, *Lophops pallida* Melichar, 1902. Some species of *Pyrilla* Stål, 1859, are associated with sugarcane and are serious pests in India.

Meenoplidae

The Meenoplidae are found only in the Old World, with around 130 species described. They may be distinguished by one or both claval veins being 'granulate'. A few species in the genera *Meenoplus* Fieber, 1866, and *Anigrus* Stål, 1866, are found in the west Palaearctic region, as well as the genus *Nisia* Melichar, 1903, which has been found in the UAE (see Wilson, 2010a, this volume).

Nogodinidae

The Nogodinidae has been a difficult family to characterise and many species that were formerly Issidae have now been transferred to it. However, the genus *Philbyella* China, 1938, is relatively easy to recognise (e.g. Plate 29) with fully developed fore and hind wings and is recorded from the Arabian Peninsula, including the UAE.

Ricaniidae

Many Ricaniidae have large tent-like forewings, which are often patterned in brown and yellow markings. They may often resemble the Flatidae but the Ricaniidae have no spines on the second tarsal segment. Over 400 species have been described but few are known from the western Palaearctic region. The genus *Saudoprivesa* Dlabola, 1980, has been described from Saudi Arabia (Dlabola, 1980).

Tropiduchidae

The family Tropiduchidae is among one of the smaller planthopper families, with around 300 species described. Most species are found in the tropics and sub-tropical regions of the world but a few genera are found in the Palaearctic region. The family is represented in the UAE by two genera, *Ommatissus* Fieber, 1872 (Plate 26) and *Kazerunia* Dlabola, 1974. The 'Dubas bug' (*Ommatissus lybicus* Bergevin, 1930) is the most destructive pest in date producing regions of the Middle East (e.g. Al-Azawi, 1986; Al-Yahyai, 2007) (see Wilson, 2010b, this volume).



32

1 mm



33

1 mm

Plates 32–33. 32: Flatidae, *Phantia* spec.; 33: Ricaniidae, *Ricania* spec.

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We are grateful to Tony van Harten for sending samples from United Arab Emirates for study, and for his encouragement.

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Order Hemiptera, families Meenoplidae and Kinnaridae

Michael R. Wilson

INTRODUCTION

The Kinnaridae and Meenoplidae are two small families of planthoppers (Fulgoromorpha), both distributed in the tropics and subtropics. The two families are considered to be closely related (Emeljanov, 1984; Bourgoin, 1997), based on the features of the external morphology and structure of both male and female genitalia. They are both superficially similar to some Cixiidae.

The Meenoplidae are found only in the Old World, with around 130 species described. A few species in the genera *Meenoplus* and *Anigrus* are found in the west Palaearctic region, as well as the genus *Nisia*, which has been found in United Arab Emirates.

The Kinnaridae with around 80 species currently described, are recognised in both the Old and New World, predominantly from the tropics and sub tropics. Several genera are recorded in the Palaearctic region, including two from the Canary Islands (Remane, 1985), and several species from Iran, USSR and Afghanistan (Emeljanov, 1984). The discovery in the UAE of three species in the genus *Perloma* is remarkable, since the genus is known only by a few species based on a small number of specimens.

MATERIALS AND METHODS

The majority of specimens studied have been collected by Tony van Harten. They have been removed from alcohol either by critical point drying or by careful air drying and mounted on card points. Some additional specimens were collected in Oman by B. Skule.

Holotypes and some paratypes of the new species are deposited in National Museum of Wales (NMWC). Additional and duplicate material is deposited in BMNH, ZIN, and the United Arab Emirates Invertebrate Collection (UAEIC).

Unless otherwise noted specimens listed have been collected by A. van Harten. Abbreviations used in text LT = light trap, MT = Malaise trap, WT = water trap.

SYSTEMATIC ACCOUNT

Family Meenoplidae

Genus *Nisia* Melichar, 1903

Nisia nervosa (Motchulsky 1863)

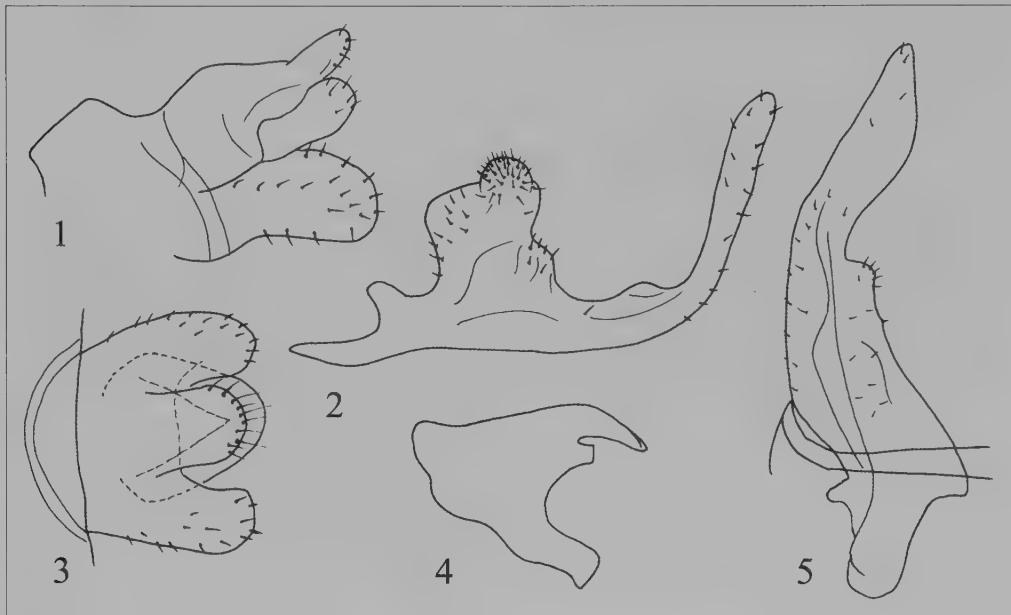
Plate 1

Specimens examined: Wadi Shawkah, 1♂, 31.x–11.xi.2006, WT, Wadi Wurayah farm, 2♀, 15–30.iii.2009, LT. OMAN: Sayq, 22°30'W 59°86'E, 2♀, 5.vii.1995, at light, leg. B. Skule (NMWC).

Remarks: This species is widely distributed across the Palaearctic region from the Canary Islands to China, into Africa and the tropical areas of SE Asia and the Pacific. Genitalia structure in the males seems to be variable enough that some separate species have been described (e.g. Tsaur et al., 1986). Wilson (1981) highlighted the need to study the variation across the range of this taxon. Host records usually involved Cyperaceae, including *Cyperus rotundus*.



Plates 1-3. 1: *Nisia nervosa* (Motchulsky), habitus. 2-3. *Perloma brunnescens* (Emeljanov). 2: Habitus; 3: Face. (Photograph © James Turner / NMWC)



Figures 1–5. *Perloma brunnescens* (Emeljanov). Male genitalia. 1: Anal segment, lateral view; 2: Paramere, lateral view; 3: Anal segment, dorsal view; 4: Aedeagus, lateral view; 5: Paramere, ventral view.

Family Kinnaridae

Tribe Adolendini Emeljanov, 1984

Genus ***Perloma*** Emeljanov, 1984 (= *Emeljanopleroma* Koçak, 1986)

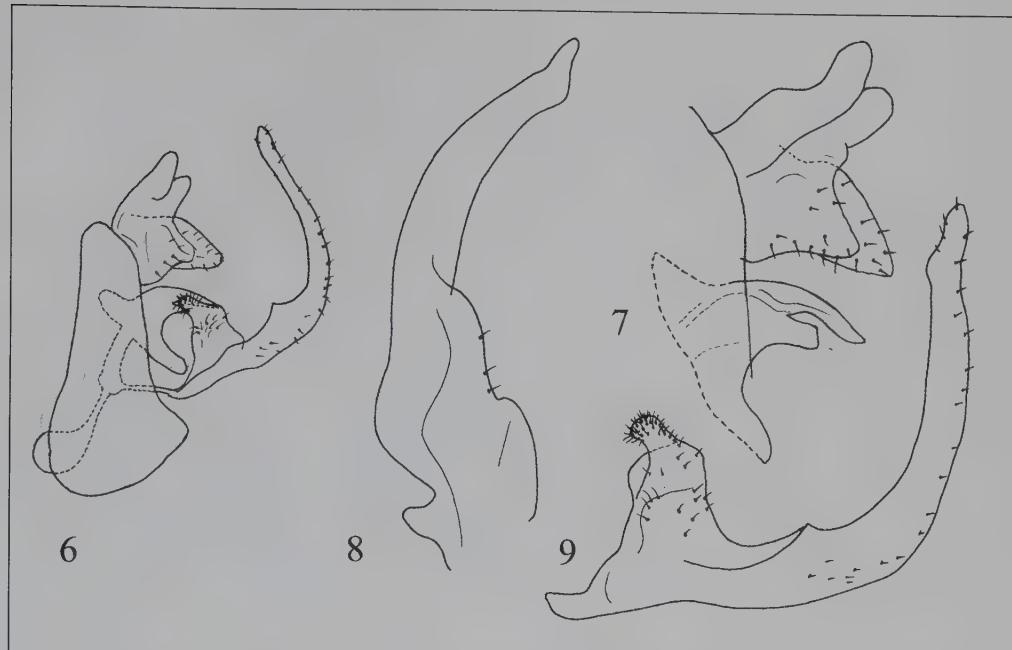
(*Propleroma* Emeljanov, 1984 preoccupied (Koçak, 1986), replacement name *Emeljanopleroma*. Synonymized with *Perloma* by Emeljanov, 2006.)

The genus was described by Emeljanov (1984) for *Perloma brunnescens* and another species, *P. zarudnyi*, both from Iran. He also transferred two species, *boroumandi* Dlabola, 1981, and *satrapa* Dlabola, 1981, to the genus (as *Propleroma*). Van Stalle (1986) described *Propleroma atrifasciata* from Somalia, the first record of the genus in Africa.

Brief description (based on Emeljanov, 1984):

Males and females. General habitus cixoid, head small, narrower than pronotum, body moderately dorso-ventrally flattened. Forewings sloping roof-like at rest. Vertex small, constricted anteriorly, its breadth from behind almost the same as its length. Frons divided into two parts, the upper one narrow and compressed between the eyes. Lateral carinae prominent and parallel at junction of vertex and frons, dilating towards the clypeus (Plate 2). Median carina present on post clypeus. Three ocelli present, median ocellus at lower margin of frons. Pronotum short, lateral parts broader. Scutellum with three distinct carinae, lateral carinae virtually parallel, slightly divergent posteriorly.

Colour: Light to darker brown overall, legs lighter. Head dark brown, antenna lighter. Forewings with variable amounts of brown markings across veins and small patches on veins basally (see Plate 1)



Figures 6–9. *Perloma longistylis* nov. spec. Male genitalia. 6: Pygophore, lateral view; 7: Aedeagus and anal segment, lateral view; 8: Paramere, ventral view; 9: Paramere, lateral view.

Male genitalia. In lateral view pygophore dilated ventrally. Anal segment with short blunt ended lobes. Aedeagus cylindrical, short with curved process above. Parameres long and curved, with inflated lobes at base, which cover the aedeagus, or shorter and less curved (in *P. maidaqensis* nov. spec.).

Remarks: The three species discussed here are very similar externally and with similar patterns of forewing markings. They differ primarily based on the male genitalia structure. Females cannot yet be reliably distinguished from each other.

Size: 4–5 mm.

Perloma brunnescens (Emeljanov, 1984)

Specimens examined: Hatta, 1♂, 8–26.v.2006, LT. Sharjah-Khor Kalba, near tunnel, 1♂, 7–22.iii.2006, LT; 1♂, 31.v–vi.2006, LT. Wadi Maidaq, 19♂, various dates in 2006, LT & WT. Wadi Wurayah farm, 2♂, 15–30.iii.2009, LT.

Description: As generic description given above.

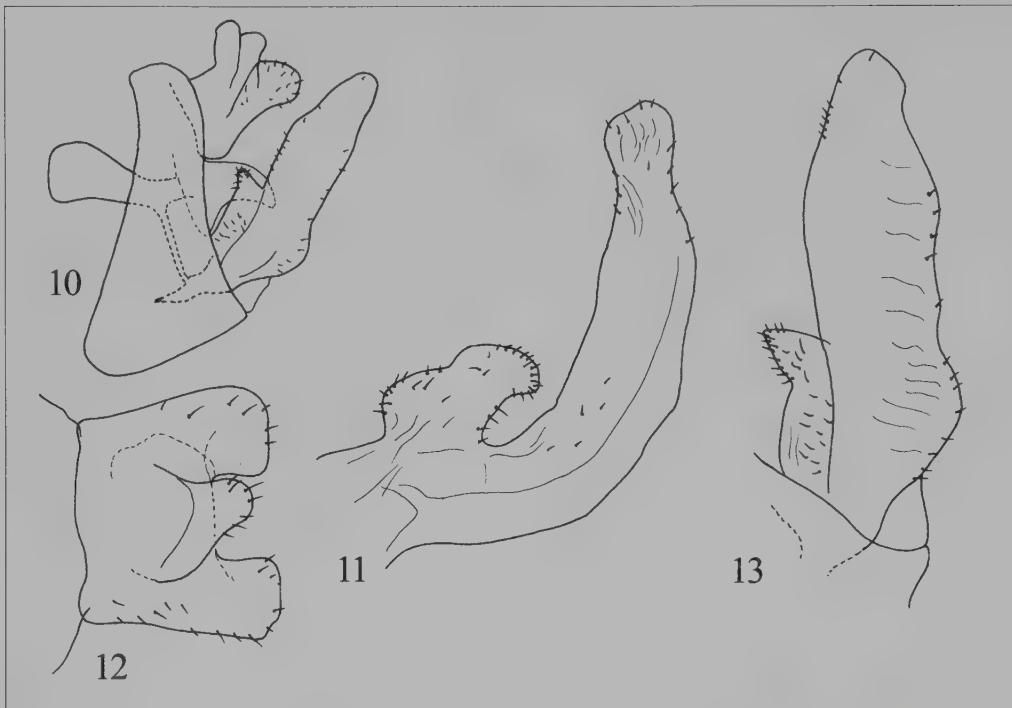
Male genitalia as shown in Figures 1–5. Parameres shorter than those in *P. longistylis* nov. spec. (especially visible in lateral view).

Distribution: *P. brunnescens* was described (Emeljanov, 1984) based on 1 male and 1 female from Iran (Karavander) collected in 1901. The species is newly recorded from the UAE.

Perloma longistylis Wilson nov. spec

Figures 6–9

Specimens examined: Holotype: ♂, labelled "U.A.E.: Wadi Maidaq, 25°28'N 56°07'E, 26.x–9.xi.2006, WT, A. van Harten". Deposited in the NMWC. Paratypes: 1♂, same data as holotype. 1♂, same locality



Figures 10–13. *Perloma maidagensis* nov spec. Male genitalia. 10: Pygophore, lateral view; 11: Paramere, lateral view; 12: Anal segment, dorsal view; 13: Paramere, ventral view.

but 7–14.iii.2006, WT; 2♂, same locality but 29.iii–10.iv.2006, WT. OMAN: Sayq, 22°30'W 59°86'E, 5.vii.1995, at light, leg. B. Skule (NMWC).

Description: As generic description above. Male genitalia as shown in Figures 6–9. Parameres long, thin and strongly curved.

Differential diagnosis: Separated from other species in the genus by the long, curved parameres.

Distribution: UAE and Oman.

Perloma maidagensis Wilson nov. spec.

Plates 13–16

Specimens examined: Holotype: ♂, labelled "U.A.E.: Wadi Maidaq, 25°28'N 56°07'E, 22.iv–4.v.2006. LT. A. van Harten". Paratype ♂: same data as holotype. Deposited in the NMWC.

Description: Specimens as generic description above. Male genitalia as shown in Figures 10–13. Parameres short and broadly cylindrical.

Differential diagnosis: Separated from other species in the genus by the short parameres.

Distribution: UAE.

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I am pleased to thank Tony van Harten for providing the species used in this study. Thanks also to James Turner who assisted in providing habitus photographs.

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Order Hemiptera, family Tropiduchidae

Michael R. Wilson

INTRODUCTION

The family Tropiduchidae is among one of the smaller planthopper families, with around 300 species described. Most species are found in the tropics and sub-tropical regions of the world but a few genera are found in the Palaearctic region. The family is represented in UAE by two genera, *Ommatissus* Fieber, 1872, and *Kazerunia* Dlabola, 1974. Small numbers of specimens of each genus have been found so far. *Ommatissus* species appear to be associated with various species of palms (Asche & Wilson, 1989). The ‘Dubas bug’, *Ommatissus lybicus* Bergevin, 1930, is the most destructive pest in date producing regions of the Middle East (eg. Al-Azawi, 1986; Al-Yahyai, 2007). It has become increasingly difficult to control despite intensive annual spraying of insecticides. Howard & Wilson (2001) review this species and other palm-associated species of Auchenorrhyncha.

MATERIALS AND METHODS

Specimens studied have been removed from alcohol either by critical point drying or by careful air drying and mounted on card points.

Specimens are deposited in National Museum of Wales, Cardiff, UK (NMWC).

SYSTEMATIC ACCOUNT

Family Tropiduchidae

Tribe Trypetimorphini Fieber, 1872

Genus *Ommatissus* Fieber, 1872

Ommatissus lybicus Bergevin, 1930.

Plate 1

Specimens examined: Wadi Maidaq, 1♂, 25.iv–4.v.2006, in light trap, leg. A. van Harten.

Remarks: This species is commonly known as the ‘Dubas bug’ and is an important pest of date palm (*Phoenix dactylifera*) in the Middle East. It appears to be confined to this host plant. Full details of its separation from other *Ommatissus* species are given in Asche & Wilson (1989).

Distribution: Widespread in the Middle East, with records from Egypt, Israel, Saudi Arabia, Oman, Iraq and Iran. Since 2002 also spreading in Yemen (A. van Harten, pers. comm.). Recorded, as *Ommatissus binotatus* (Fieber, 1876), from the UAE by Gassouma (1991).

Tribe Kazerunini Dlabola, 1974

Genus *Kazerunia* Dlabola, 1974

Kazerunia spec.

Plate 2

Specimens examined: Wadi Maidaq, 1♀, 14–25.i.2006, in water trap, leg. A. van Harten; 1♀, 29.iii–10.iv.2006, in water trap, leg. A. van Harten.



Plate 1. *Ommatissus lybicus* Bergevin. (Photograph © James Turner / NMWC)

Remarks: Several *Kazerunia* species have been described from Iran (Dlabola, 1974, 1977) but this appears to be the first record from the Arabian Peninsula. The specimens from the UAE externally resemble *K. undulata* Dlabola, 1977. The species are all flightless, with reduced forewings and hind wings absent. It is likely that targeted sampling from ground vegetation may provide further specimens.

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Plate 2. *Kazerunia* spec., female from Wadi Maidaq. (Photograph © James Turner / NMWC)

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Order Coleoptera, family Hydrophilidae

Martin Fikáček, Elio Gentili and Andrew E. Z. Short

INTRODUCTION

The water scavenger beetles (family Hydrophilidae) are the largest group of the superfamily Hydrophiloidea, comprising about 2500 known species (Hansen, 1999; Short & Hebauer, 2006). The family is known among entomologists especially due to its aquatic representatives, which are often abundant in most kinds of stagnant waters, but also commonly inhabit streams, rivers and seepage habitats. Besides these aquatic species, the family also contains terrestrial taxa that inhabit mostly leaf litter and other kinds of decaying organic material. Within the Palaearctic region, most terrestrial species inhabit excrements of various herbivorous or omnivorous mammals (e.g. cows, goats, deer, bears etc.). Most aquatic species are classified in the subfamily Hydrophilinae and most terrestrial ones in the subfamily Sphaeridiinae, but there are many exceptions in both subfamilies. Adult beetles are mostly saprophagous, feeding on different kinds of decaying organic matter, whereas larvae are predaceous, preying on various invertebrates.

The latest studies on the hydrophilid fauna of the Arabian Peninsula were published by Gentili (1989) and Hebauer (1997), who examined a large amount of recently collected as well as historical specimens. These studies, along with an older study by Balfour-Browne (1951), provide a rather comprehensive summary of the Arabian hydrophilids. However, most of the material available came from Yemen and Saudi Arabia and only a limited material from Oman was examined. In consequence, the fauna of the north-eastern part of the peninsula remained nearly unknown. The survey of the invertebrates of the UAE conducted by Antonius van Harten provided, therefore, an opportunity to complete the knowledge on Arabian hydrophilids.

Up to now, 19 genera and 53 species of the Hydrophilidae were recorded from the Arabian Peninsula (Gentili, 1989; Hebauer, 1997). Twenty six hydrophilid species were recorded from the UAE during the mentioned survey; four of these species are recorded for the first time from the Arabian Peninsula (*Laccobius orsenigoi* Gentili, *Enochrus sinuatus* d'Orchymont, *Cercyon lineolatus* (Motschulsky), *Berosus chinensis* Knisch) and two species are described as new to science (*Laccobius harteni* nov. spec. and *Cercyon deserticola* nov. spec.). Brief diagnoses, notes on the biology and distribution and habitus photographs of the recorded species are provided. Except for the material from the UAE, additional records of *Thysanarthria* cf. *sulcata* (Chiesa) and *Laccobius orsenigoi* from Iran and Oman are provided.

In addition to the Hydrophilidae, representatives of the hydrophiloid families Helophoridae and Georissidae were recorded from the UAE during the mentioned survey. Results concerning these families have already been summarized in the previous volume by Fikáček (2009) and Fikáček & Trávníček (2009).

MATERIALS AND METHODS

The material presented within this study was divided between the co-authors according their taxonomic focus as follows: Martin Fikáček (*Thysanarthria*, *Paracymus*, *Arabhydrus*, *Sphaeridiinae*), Elio Gentili (*Laccobius*), Andrew Short (*Berosini*, *Hydrophilini*). A portion of specimens was dissected, with genitalia mounted on a plastic card below the beetle in water-

soluble dimethyl hydantoin resin (specimens dissected by M. Fikáček), on the same label as the beetle using the same resin (specimens dissected by E. Gentili) or left attached to the beetle (specimens identified by A. Short). Drawings of genitalia were traced from photographs of the microscopic slides prepared using a Nikon TS100 light microscope. Habitus photographs were prepared using Olympus Camedia C-5060 camera attached to an Olympus SZX9 binocular microscope. The nomenclature used, including the subdivisions into subgenera follows the world catalogue by Hansen (1999), morphological nomenclature largely follows Hansen (1991) with some modifications introduced by Komarek (2004).

Examined specimens are deposited in the following collections: National Museum, Praha, Czech Republic (NMPC, M. Fikáček); Division of Entomology, University of Kansas Natural History Museum, Lawrence, USA (KSEM, A. Short); Museo Civico di Storia Naturale, Verona, Italy (MSNV, L. Latella); United Arab Emirates Invertebrate Collection (UAEIC); Natural History Museum, London (BMNH, M. Barclay); Naturhistorisches Museum, Wien, Austria (NHMW, M.A. Jäch). A part of the material of abundant species is stored in alcohol in NMPC.

If not otherwise stated, specimens were collected by A. van Harten. Abbreviations used: LT = light trap, MT = Malaise trap, PT = pitfall trap, WT = water trap, NARC = National Avian Research Centre.

SYSTEMATIC ACCOUNT

Subfamily **Hydrophilinae** Latreille, 1802

Tribe **Berosini** Mulsant, 1844

Genus **Berosus** Leach, 1817

Representatives of the genus *Berosus* are mostly medium-sized, brownish beetles and may have darkened spots or maculae on their pronotum or elytra. They are elongate and strongly convex, making them relatively distinctive among the water scavenger beetle fauna of Arabian Peninsula; only *Regimbartia* is similar in body shape, but that genus is entirely black and more laterally compressed. They are strong swimmers, possessing long setae on their legs, and are often associated with standing waters or slow moving, marginal areas of streams or rivers. One of the largest genera of aquatic hydrophilids, there are more than 265 species found in all biogeographic regions (Hansen, 1999; Short & Hebauer, 2006). Seven species in two subgenera (*Enoplurus* and *Berosus* s. str.) are known from the Arabian Peninsula: *B. (s. str.) fuscostriatus* Fairmaire, 1892, *B. (s. str.) insolitus* Orchymont, 1937, *B. (s. str.) nigriceps* (Fabricius, 1801), *B. (s. str.) problematicus* Schödl, 1993, *B. (s. str.) pulchellus* McLeay, 1825, *B. (s. str.) rubiginosus* Kuwert, 1890 and *B. (Enoplurus) cf. asiaticus* Kuwert, 1888. Three of these species are recorded from the UAE, along with *B. chinensis* (which is recorded for the first time from the Arabian Peninsula), and a fifth, possibly undescribed species.

Berosus* (s. str.) *fuscostriatus Fairmaire, 1892

Plate 1

Specimens examined: Fujairah, 1♀, 28.ii–1.iv.2006, LT. Wadi Safad, 1♂, 2–26.i.2006, WT.

Differential diagnosis: This species may be distinguished by its very large size, lack of spinose or emarginated elytral apices, lack of markings on the pronotum, and a covering of rather coarse setae on the pronotum and elytra.

Biology: Aquatic species; UAE specimens were collected at light and in pan traps.

Distribution: An element of the North Africa and Arabian faunas, this species has been previously recorded from Djibouti, Mauritania, Oman, Saudi Arabia, Yemen, and Algeria (Hansen 1999). New to the UAE.

Berosus (s. str.) nigriceps (Fabricius, 1801)

Plate 2

Specimens examined: Al-Ajban, 5♂, 10 ex., 28.xii.2005–29.i.2006, LT. Fujairah, 3 ex., 28.ii–1.iv.2006, LT; 3 ex., 15–22.iv.2006, LT. Sharjah Desert Park, 1♂, 18.i–25.ii.2006, LT. NARC, near Sweihan, 1 ex., 16.xi–21.xii.2005, LT. Wadi Safad, 1 ex., 2–26.i.2006, WT; 1 ex., 31.i–21.ii.2006, LT; 1 ex., 14–21.v.2006, LT. Wadi Wurayah, 1♂, 31 ex., 18–25.iii.2007, MT.

Differential diagnosis: This species is diagnosed by its comparatively small size, lack of markings on the pronotum, lack of spinose elytral apices, and a covering of hairs on its pronotum and elytra.

Biology: Aquatic species; most UAE specimens were collected at light.

Distribution: Widely distributed species occurring throughout Africa, from the southern Sahara (Chad, Mauritania, Niger, Sudan) to South Africa. Its range extends eastward through the Arabian Peninsula (Saudi Arabia, Oman, Yemen) into India and Bangladesh (Hebauer, 1997; Schödl 1993, 1994). New to the UAE.

Berosus (s. str.) rubiginosus Kuwert, 1890

Plate 3

Specimens examined: Hatta, 2 ex., 17–28.iii.2006, LT; 1 ex., 8–26.iv.2006, LT. Near Mahafiz, 15 ex., 21–28.viii.2006, LT. Sharjah-Khor Kalba, near tunnel, 1 ex., 24–30.v.2006, LT; 1 ex., 31.v–7.vi.2006, LT. Wadi Maidaq, 1 ex., 17–24.v.2006, LT; 8 ex., 1–8.vii.2006, LT. Wadi Safad, 2 ex., 17–24.vi.2006, LT; 7 ex., 1–8.vii.2006, LT.

Differential diagnosis: This smaller species may be distinguished by dark maculae in the center of the pronotum and on the elytra, coarse dorsal punctuation, and its rather short-oval body form.

Biology: Aquatic species; all UAE specimens were collected at light.

Distribution: Primarily an Afrotropical species, this species has been previously recorded as far north as Oman and Saudi Arabia (Hebauer, 1997). New to the UAE.

Berosus (Enoplurus) chinensis Knisch, 1922

Specimens examined: Wadi Maidaq, 1♂, 17–24.v.2006, LT.

Differential diagnosis: This medium sized species may be distinguished by its spinose elytral apices (as in the following species), distinctly darkened punctation on the pronotal disc, inner elytral projections prolonged in both sexes and a characteristic tooth-like shape of the apical part of the median lobe in lateral view (see Schödl, 1991, 1992).

Remarks: Even though the only examined specimen is slightly teneral, it clearly corresponds with the specimens of *B. chinensis* from Iran identified by S. Schödl (deposited in NMPC).

Biology: An aquatic species; the only specimen examined was collected at light.

Distribution: Widely distributed species reaching from northern Arabian Peninsula and southern Iran through Pakistan, Nepal and northern India to the northeastern part of the Oriental region. The species is recorded here for the first time from the Arabian Peninsula.

Berosus (Enoplurus) spec.

Plate 4

Specimens examined: Wadi Safad, 1 ex., 2–26.i.2006, WT; 1 ex., 17–24.vi.2006, LT. Wadi Maidaq, 1 ex., 1–8.vii.2006, LT. Sharjah-Khor Kalba, near tunnel, 1 ex., 31.v–7.vi.2006, LT.

Differential diagnosis: This medium sized species may be distinguished by its spinose elytral apices, entirely pale pronotum, and the presence of multiple irregular rows of punctures on elytral interval 4.

Remarks: This species seems closely related to *B. chinensis* and allies, but the entirely pale



1



2

2 mm



3



4

Plates 1–4. 1: *Berosus* (s. str.) *fuscostriatus* Fairmaire; 2: *Berosus* (s. str.) *nigriceps* (Fabricius); 3: *Berosus* (s. str.) *rubiginosus* Kuwert; 4: *Berosus* (*Enoplurus*) spec.

pronotum and slight differences in aedeagal shape do not allow us to make a positive identification at this time. It may represent an undescribed species.

Genus *Regimbartia* Zaitzev, 1908

Representatives of this genus are easily distinguished by their characteristic hump-backed, strongly convex and laterally compressed appearance in combination with their entirely black colouration. They are not easily confused with any other genus occurring on the Arabian Peninsula. There are currently ten described species occurring mostly in the Old World tropics (Hansen, 1999). Only a single species is known from the Arabian Peninsula, where it is here recorded from the UAE for the first time.

Regimbartia attenuata (Fabricius, 1801)

Plate 5

Specimens examined: Hatta, 1♂, 4–11.iv.2006, LT.

Differential diagnosis: *Regimbartia attenuata* is the only species of the genus occurring in the Arabian Peninsula and cannot be therefore confused with any Arabian hydrophilid species (for details, see generic diagnosis above).

Biology: Aquatic species; UAE specimen was collected at light.

Distribution: Widely distributed species in the Old World, ranging from northern Australia and Japan westward to the Arabian Peninsula, where it has been previously recorded from Oman and Yemen (Balfour-Browne, 1951; Hebauer, 1997). New to the UAE.

Tribe *Chaetarthriini* Bedel, 1881

Genus *Thysanarthria* d'Orchymont, 1926

Representatives of this genus can be distinguished from remaining Arabian hydrophiloid genera by the fringe of long hairs covering the abdominal ventrite 1 and 2 (see Hansen (1987), Fig. 326, or Hansen (1991), Fig. 322) and elytra bearing 10 longitudinal striae. The genus comprises 10 species distributed from Africa through the Arabian Peninsula and central Asia to India and southeastern Asia (Hebauer, 2001). Two species, *T. brittoni* Balfour-Browne, 1951 and *T. sulcata* (Chiesa, 1967) were recorded from the Arabian Peninsula (Balfour-Browne, 1951; Hebauer, 1997).

Thysanarthria cf. *sulcata* (Chiesa, 1967)

Plate 6

Specimens examined: Hatta, 1♀, 8–26.iv.2006, LT.

Additional specimens examined (not from the UAE): IRAN: Fars province, Aliabad, 75 km NW of Jahrom (locality no. 53), 1♂, 10.vii.1970, Expedition of the National Museum Prague, coll. NMPC. Sistan va Baluchestan province, 16 km SE of Tang-e-Sarkheh, 900 m a.s.l., locality no. 154, 1♂, 4 ex., 10.iv.1973, Expedition of the National Museum Prague, coll. NMPC.

Remarks: The taxonomy of the genus *Thysanarthria* is based nearly exclusively on the morphology of the male genitalia. Hebauer (2001) provides additional characters concerning body size, presence/absence of microsculpture on the pronotum and head, and general dorsal colouration. Based on the examined Iranian specimens, colouration seems to vary among specimens and is therefore only hardly usable for identification. Also male genitalia of the mentioned Iranian specimens vary slightly in precise shape of the parameres. Moreover, the genitalia of these specimens do not correspond with the drawing of the aedeagus of *T. sulcata* provided by Hebauer (2001) in some details, especially in the shape of the median lobe. Externally, the Iranian specimens correspond with the female from the UAE. Based on the known distribution of *T. sulcata* (see below), we consider the UAE as well as the Iranian



Plates 5–6. 5: *Regimbartia attenuata* (Fabricius); 6: *Thysanarthria* cf. *sulcata* (Chiesa) (specimen from Iran).

specimens to most probably represent this species, but our identification requires confirmation by the study of the type specimens.

Biology: Nothing is known about the biology of this species, the mentioned specimen from UAE was collected at light.

Distribution: *Thysanarthria sulcata* was described from north-eastern Afghanistan (Chiesa, 1967) and later recorded from eastern Oman by Hebauer (1997). The records presented here might be the first data on its occurrence in the UAE and in southern Iran.

Tribe Laccobiini Bertrand, 1954

Genus *Arabhydrus* Hebauer, 1997

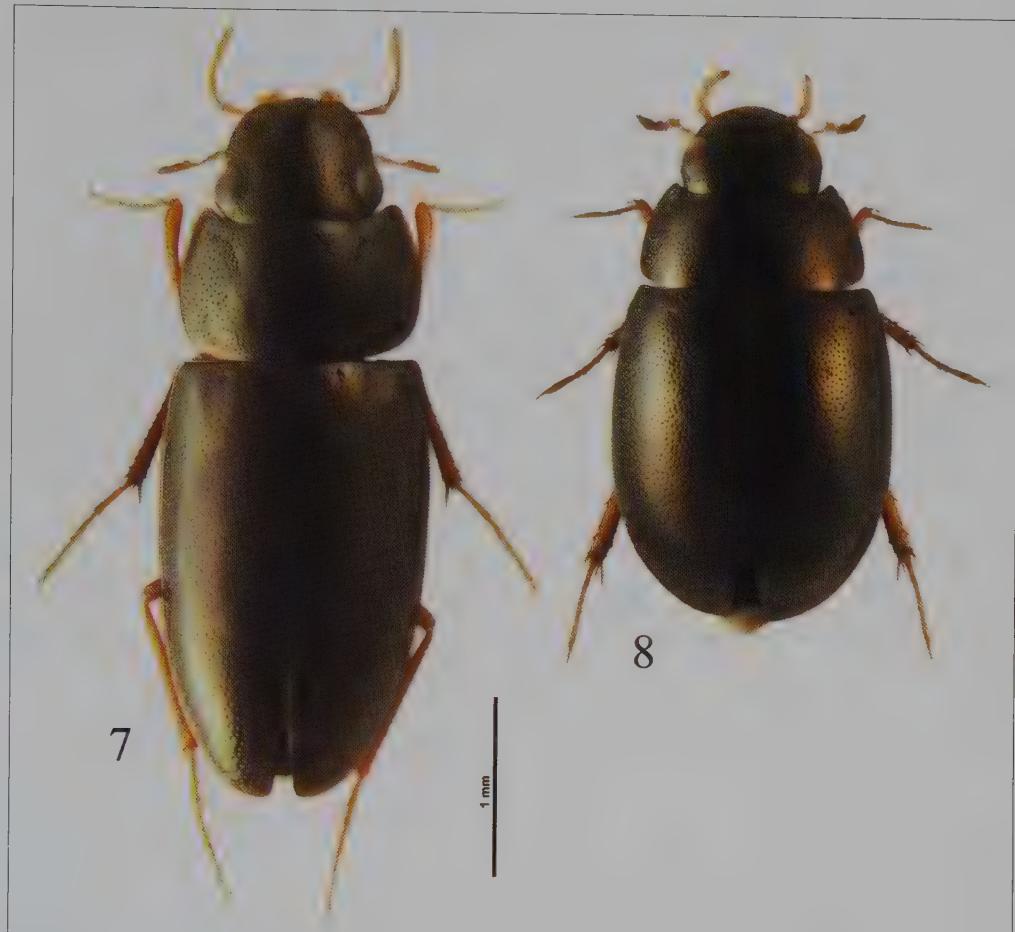
Monotypic genus endemic to the northern part of the Arabian Peninsula, described and previously known only from Oman (Hebauer, 1997), in the present study it is recorded from the UAE for the first time.

Arabhydrus gallagheri Hebauer, 1997

Specimens examined: Hatta, 1 ex., 4–11.iv.2006, LT; 1♂, 8–26.iv.2006, LT; 1♀, 17–24.viii.2006, LT. Wadi Shawkah, 5 ex., 27.xi.2006, hand-collected, leg. J.-L. Gattoliat. Wadi Wurayah, 1♂, 1 ex., 4.xii.2006, in pool and stream, leg. J.-L. Gattoliat. Wadi Wurayah farm, 1 ex., 8–15.iii.2009, LT; 9 ex., 1–8.iv.2009, LT; 6 ex., 12–19.iv.2009, LT.

Note: Examined specimens were compared with the paratypes deposited in the collection of E. Gentili (to be deposited in MSNV). All specimens from the UAE available to us are

Plate 7, Figures 12–13



Plates 7–8. 7: *Arabhydrus gallagheri* Hebauer; 8: *Paracymus relaxus* Rey.

slightly smaller than those from the type series, but otherwise correspond with the latter both in external characters as well as the morphology of male genitalia (Figs. 12–13). The drawing of male genitalia published in the original description (Hebauer, 1997) differs considerably, but this seems to be caused by the fact that the aedeagus was probably drawn in a dried condition. Because of the strongly tri-dimensional shape of the median lobe, the apical toothlets illustrated in Figure 12 are less clear when the aedeagus is seen not precisely in ventral view.

Differential diagnosis: The genus and species is easily recognizable by its elongate body shape, black colouration, extremely long legs, elytra lacking sutural stria and longitudinal punctural series and abdomen with 6 ventrites. From other Arabian hydrophilids, it slightly reminds only the genus *Paracymus* based on its general habitus. However, *Paracymus* differs from *Arabhydrus* e.g. by elytra with sutural stria, abdomen with only 5 ventrites, and totally different morphology of male genitalia.

Biology: Part of the specimens examined were collected in the stream in desert wadis, remaining specimens were collected at light. Presence of swimming hairs on the meso- and metatibiae and tarsi suggest that it is an active swimmer.

Distribution: The species is endemic to northern part of the Arabian Peninsula, where it occurs in Oman and the UAE.

Genus *Laccobius* Erichson, 1837

Arabian representatives of the genus *Laccobius* are rather uniform in general habitus and can be easily distinguished from remaining hydrophilid genera occurring in the Arabian Peninsula by the combination of abdomen with 6 ventrites, curved posterior tibiae, and short maxillary palpi. Most Arabian species can be moreover recognized by a characteristic colouration (head dark, sometimes with pale spots anterior of eyes; pronotum yellow with dark central spot; elytra yellowish with darker spots arranged in longitudinal stripes (this colouration is not developed in *L. eximus* Kuwert, 1890 (Plate 11) and *L. arabicus* Gentili, 1980); and by the elytron usually bearing more or less serially arranged punctures (serially arranged punctures are missing only in *L. arabicus*). The genus contains nearly 250 species distributed worldwide in standing as well as running waters or at hygropetric habitats. Seven species were recorded previously from the Arabian Peninsula: *L. (Cyclolaccobius) arabicus* Gentili, 1980, *L. (Dimorpholaccobius) eremita* Gentili, 1989, *L. (Hydroxenus) leucaspis* Kiesenwetter, 1870, *L. (M.) subpictus erlangeri* (Régimbart, 1905), *L. (Microlaccobius) eximus* Kuwert, 1890, *L. (M.) minor* (Wollaston, 1867), and *L. (M.) praecipuus* Kuwert, 1890. Two additional species are known from the Sinai Peninsula (*L. (Dimorpholaccobius) syriacus* Guillebeau, 1896, and *L. (Microlaccobius) hebaueri* Gentili, 1989) (Gentili, 1989; Hebauer, 1997). The present study adds two further species for the Arabian Peninsula: *L. (Microlaccobius) orsenigoi* Gentili, 1980, and *L. (M.) harteni* nov. spec.

Laccobius (Microlaccobius) harteni Fikáček, Gentili & Short nov. spec.

Plate 10, Figures 16–18

Specimens examined: Holotype: ♂, Bithnah, 25°11'N 56°14'E, 31.xii.2005–2.ii.2006, in light-trap, leg. A. van Harten, coll. NMPC. Paratypes: 1♂, 1♀, Hatta, 22–29.i.2006, LT; 1♂, 1♀, 24–30.v.2006, LT. 1♀, Sharjah Desert Park, 25.ii.–25.iii.2006, LT; 1♀, 17.ii.–3.iii.2007, LT. 1♂, 2♀, Wadi Fara, al-Ghail env., 25°26'06"N 55°04'50"E, 266 m a.s.l., 17.iii.2007, leg. J. Batelka & H. Pinda. 2♂, 3♀, Wadi Hayl, 3.xii.2006, in water, leg. J.-L.Gattolliat. 1♀, Wadi Maidaq, 2–16.ii.2006, LT. 2♂, Wadi Safad, 31.i.–21.ii.2006, LT; 7♂, 3♀, 14–21.v.2006, LT; 4♂, 3♀, 28.xi.2006, in stream, leg. J.-L. Gattolliat. 2♀, Wadi Shawkah, 27.xi.2006, hand-collected, leg. J.-L. Gattolliat. 4♂, 3♀, Wadi Wurayah, 4.xii.2006, in pool and stream, leg. J.-L. Gattolliat.

Differential diagnosis: The differential characters from similar two Arabian species of *Microlaccobius* Gentili, 1972 (*L. eximus* and *L. praecipuus*) are given in Table 1. From the remaining Arabian *Microlaccobius*, *L. harteni* can be distinguished by the morphology of the aedeagus: *L. hebaueri* can be distinguished by the median lobe completely divided into two halves in apical portion (median lobe is not divided apically in *L. harteni*, *L. praecipuus* and *L. eximus*), *L. orsenigoi* and *L. minor* can be distinguished by much larger, wider, shorter and more sclerotized median lobe.

Description: Body suboval, maximum width in anterior 0.35 of elytra; elytra narrowed posteriad, moderately convex. Length 2.10–2.70 mm (holotype: 2.60 mm); width 1.10–1.35 mm (holotype: 1.30 mm).

Colouration. Labrum, clypeus and frons blackish, pale preocular spots absent or very vaguely defined. Pronotum black mesally, yellowish anteriorly and laterally; black spot reaching anterior margin at least centrally. Elytra yellowish, with longitudinal black stripes

corresponding to punctural rows and disappearing near base, periphery and apical zone; shoulders with black callosity. Ventral side dark brown; trochanters and femoral bases brownish, more distal parts yellowish.

Head. Clypeus and frons with fine and unequal punctuation, punctures irregularly spaced, interstices often $2-3 \times$ as wide as one puncture; interstices without microsculpture. Frontoclypeal suture weakly visible. Clypeus larger than frons, maximum clypeal width / clypeal length ratio = 2.2; clypeus less punctate than frons. Ocular index (smallest distance between eyes / diameter of an eye in frontal view ratio) = 3.0; eyes very weakly constricted laterally by clypeus. Antennae with 8 antennomeres (scape, pedicel, 2 intermediate antennomeres, symmetrical cupule, club of 3 pubescent antennomeres of decreasing size). Maxillary palpus slender, palpomere 2 inflated, palpomere 4 without apical infuscation. Mentum nearly flat, micropunctured laterally, with sparse and rare punctures. Labial palpi slender, as long as maxillary palpomere 1. Labial palpomere 3 very small, palpomere 4 inflated.

Table 1: Characters separating *L. eximus*, *L. praecipuus* and *L. harteni* nov. spec. and the known distribution of these taxa in the Arabian Peninsula.

	<i>L. eximus</i>	<i>L. praecipuus</i>	<i>L. harteni</i>
Body size	2.8–3.0 mm	2.1–2.6 mm	2.1–2.7 mm
Dorsal colouration	nearly uniformly dark with reddish to blackish nuances (Plate 11)	clearly bicoloured, yellowish with dark spots (Plate 9)	clearly bicoloured, yellowish with dark spots (Plate 10)
Pale borders of pronotum	vaguely defined	well defined	well defined
Yellow stripes of elytra	scarcely visible	clearly visible, alternating with dark stripes	clearly visible, alternating with dark stripes
Preocular spots	absent	vaguely defined	absent or very vaguely defined
Length of phallobase / length of paramere	1.0	0.9	0.7
General shape of median lobe	wide, slightly widened ca. at midlength (Figs 7–9)	narrow, conical, gradually narrowing from base to apex (Figs 1–3)	wider, constricted in apical third, widely rounded apically (Figs 4–6)
Apical inflation of median lobe	absent	absent	present
Known distribution in Arabian Peninsula	Saudi Arabia (higher altitudes)	throughout Arabian Peninsula	UAE

Thorax: Punctuation of pronotum as fine and sparse as on head; interstices without microsculpture. Scutellar shield black, with few very fine punctures. Elytron with 20 primary and secondary rows of punctures, primary rows more apparent, more regular and rich in

punctures; external secondary rows incomplete. Row punctures distinctly larger than pronotal punctures. Elytral margins sulciform, completely visible in dorsal view. Prosternum tectiform, carinate longitudinally before procoxae. Mesoventrite with transverse triangular projection. Metaventrite flat, smooth mesally. Anterior trochanters with hydrofuge pubescence.

Male genitalia (Figs 4–6): Aedeagus 0.57 mm long, slender, more than 3× as long as wide. Parameres 1.4× longer than phallobase. Median lobe slightly longer than parameres; base deeply excavated between basal apophyses, basal portion wide, narrowing to apical 0.33, basal 0.66 with narrow lateral projections, strongly curved dorsally; apical portion widened into rounded apex ventrally. Parameres enclosing base of median lobe, with outer margins nearly straight; inner margins straight, but diverging in a V-shape.

Biology: Examined specimens were partly collected at light, and partly in pools and streams.

Distribution: The species is so far known only from several localities situated in the north-eastern part of the UAE.

Etymology: The species is dedicated to Antonius van Harten, who led the whole project of the Arthropod inventory of the UAE and allowed us to study the hydrophilid material gained from this project.

Laccobius (Microlaccobius) orsenigoi Gentili, 1980

Plate 12, Figures 10–11

Specimens examined: Bithnah, 1♂, 31.xii.2005–2.ii.2006, LT; 1♀, 19.x.–16.xi.2006, MT. Fujairah, 1♂, 20–27.v.2006, LT. Hatta, 1♀, 24–30.v.2006, LT; 3♂, 1♀, 17–24.viii.2006, LT. Sharjah Desert Park, 1♀, 3–10.iii.2007, LT. Sharjah–Khor Kalba, near tunnel, 1♀, 31.v.–7.vi.2006, LT. Wadi Fara, al Ghail env., 25°25'06"N 55°04'50"E, 266 m a.s.l., 1♂ 1♀, 28.ix.2007, leg. J. Batelka & H. Pinda. Wadi Midaq, 1♂, 27.xi.–22.xii.2005, LT. Wadi Safad, 2♂, 1♀, 2–26.i.2006, WT; 2♂, 31.i.–21.ii.2006, LT; 3♂, 1♀, 14–21.v.2006, LT; 9♂, 6♀, 28.xi.2006, in stream, leg. J.-L. Gattoliat. Wadi Shawkah, 4♀, 27–28.xi.2006, at light, leg. J.-L. Gattoliat.

Additional material examined (not from the UAE): IRAN: Hormozgan: Bandarabbas 110 km E Manujan, 1♂, 2♀, 2.vi.1974, at light, leg. G. Pretzmann, coll. NHMW, MSNV. OMAN: 40 km E Badiya, Wadi Bani Kalil, 4♂, 8♀, 19.ii.1998, leg. G. Wewalka, coll. NHMW, MSNV. Salalah, Wadis near Mughsayl, 1♀, 27.ii.1998, leg. G. Wewalka, coll. NHMW.

Differential diagnosis: Among the Arabian *Laccobius*, this species is easily recognizable according to its small body size (1.8–2.2 mm), shape of the dark spot on the pronotum (Plate 12) and the characteristic shape of the aedeagus (Figs 10–11).

Biology: As in *L. harteni*, examined specimens were partly captured at light and into white and yellow pan traps, part of the specimens was collected directly in various kinds of streams.

Distribution: The species was originally described from southern Iran (Sistan va Baluchestan province: Gentili, 1980) and additionally recorded from Iranian province of Hormozgan by Gentili (1982). Here we record this species for the first time from the Arabian Peninsula, where it occurs in its northernmost parts (UAE, Oman).

Laccobius (Microlaccobius) praecipuus Kuwert, 1890

Plate 9, Figures 1–3

Specimens examined: Al-Ajban, 3♂, 1♀, 9.xi.–7.xii.2005, MT & LT; 4♂, 2♀, 28.xii.2005–29.i.2006, LT; 3♂, 6♀, 5–12.vi.2006, LT. Bithnah, 13♂, 12♀, 31.xii.2005–2.ii.2006, LT. Fujairah, 55♂, 38♀, 13.xi.–10.xii.2005, LT; 10♂, 15♀, 28.ii.–1.iv.2006, LT; 6♂, 9♀, 15–22.iv.2006, LT; 115♂, 73♀, 20–27.v.2006, LT; 3♂, 5♀, 28.xi.2006, in tank at farm, leg. J.-L. Gattoliat. Al-Hayl, 2♂, 2♀, 3.xii.2006, in water, leg. J.-L. Gattoliat. Hatta, 8♂, 12♀, 17–28.iii.2006, LT; 15♂, 6♀, 8–26.iv.2006, LT; 2♂, 1♀, 24–30.v.2006, LT; 3♂, 2♀, 17–24.viii.2006, LT. Near Mahafiz, 2♂, 3♀, 10–29.xii.2005, LT; 4♂, 11♀, 29.xii.2005–7.i.2006, LT; 1♂, 5♀, 24–30.v.2006, LT; 1♀, 21–28.viii.2006, LT. Sharjah Desert Park, 12♂, 16♀, 20.x.–8.xi.2005, LT; 20♂, 26♀, 13.xi.–11.xii.2005, LT; 26♂, 42♀, 18.i.–25.ii.2006, LT; 48♂, 52♀, 25.ii.–25.iii.2006, LT; 43♂, 57♀, 3–10.iii.2007, LT; 15♂, 17♀, 10–17.iii.2007, LT; 3♂, 2♀,



9



10

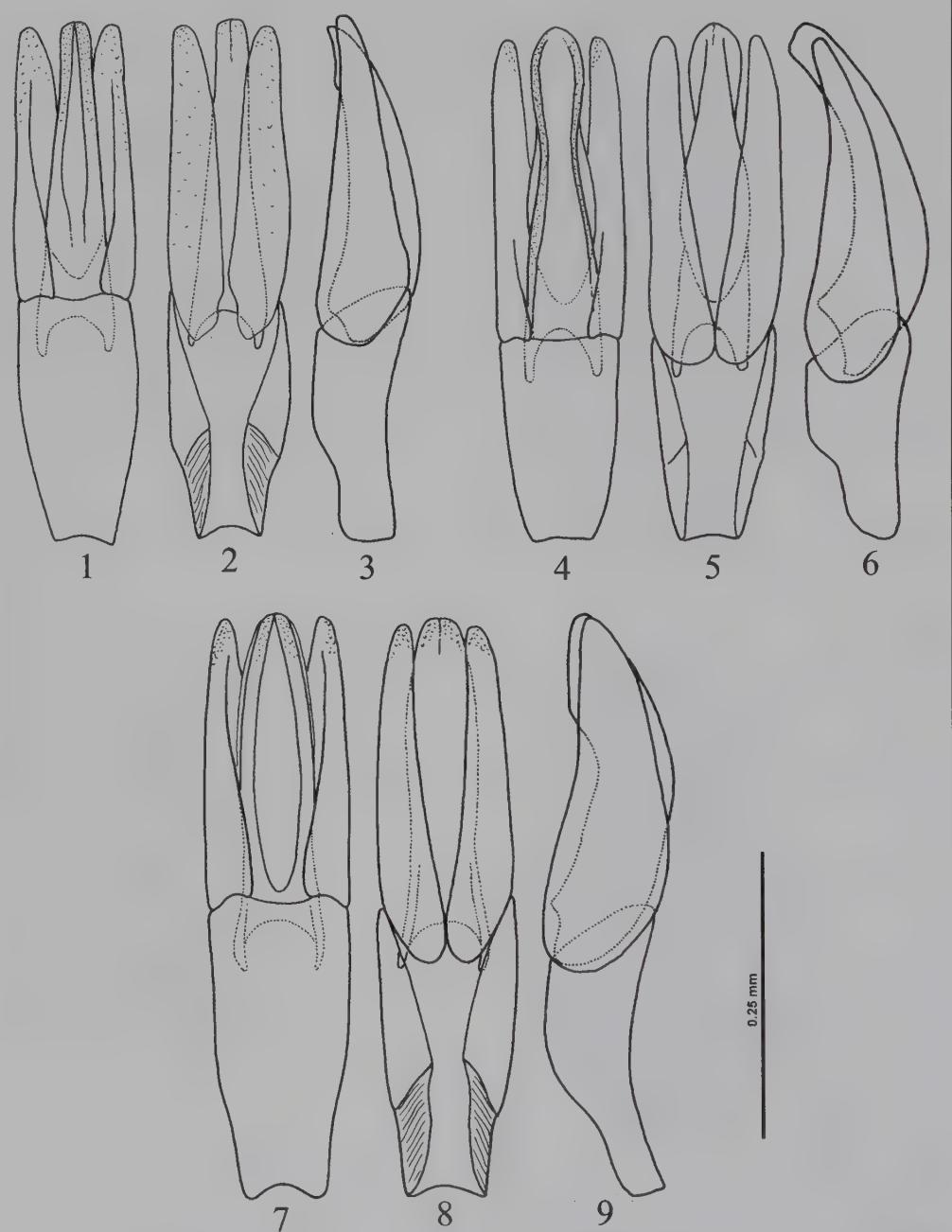


11



12

Plates 9–12. 9: *Laccobius praecipuus* Kuwert; 10: *Laccobius harteni* nov. spec.; 11: *Laccobius eximius* Kuwert (Saudi Arabia, Qarrah vill., Khamis Mt., 2000 m a.s.l.); 12: *Laccobius orsenigoi* Gentili.



Figures 1–9. Aedeagophores of *Laccobius* species. 1–3: *L. praecipuus* Kuwert; 4–6: *L. harteni* nov. spec.; 7–9: *L. eximius* Kuwert. (1, 4, 7: dorsal view; 2, 5, 8: ventral view; 3, 6, 9: lateral view).

17–24.iii.2007, LT. Sharjah-Khor Kalba, near tunnel, 8♂, 7♀, 24–30.v.2006, LT; 8♀, 31.v–7.vi.2006, LT. NARC, near Sweihan, 2♂, 1♀, 26.ii–2.iv.2006, LT. Wadi Bih Dam, 1♂, 22.ii.–1.iii.2007, LT. Wadi Maidaq, 9♂, 9♀, 27.xi–22.xii.2005, LT; 4♂, 11♀, 22.xii.2005–2.ii.2006, LT; 26♂, 16♀, 2–16.ii.2006, LT; 9♂, 11♀, 27.iv–4.v.2006, LT. Wadi Safad, 4♂, 4♀, 20.xii.2005–2.i.2006, LT; 2♂, 3♀, 2–26.i.2006, WT; 26♂, 18♀, 31.i–21.ii.2006, LT; 8♂, 1♀, 21.ii–4.iii.2006, LT; 2♂, 1♀, 14–21.v.2006, LT; 2♂, 17–24.vi.2006, LT. Wadi Shawkah, 1♂, 4♀, 27–28.xi.2006, at light and in pool, leg. J.-L. Gattoliat, coll. NMPC. Wadi Wurayah, 2♂, 1♀, 4.xii.2006, in pool and stream, leg. J.-L.Gattoliat; 3♂, 5♀, 18–25.iii.2007, MT.

Taxonomic remarks: The species concepts of *L. praecipuus* and related species *L. eximius* changed drastically during last decades and was not fixed until now. Based on the examination of the types deposited in the Oberthür collection in Museum of Natural History in Paris, Gentili & Chiesa (1975) considered *L. precipuus* originally as a subspecies of *L. gracilis*, whereas *L. eximius* was treated as a separate species based on its dark general colouration. Later, Gentili (1981) synonymized *L. eximius* with *L. gracilis* subsp. *praecipuus*. The same concept was followed by Gentili (1989), but the taxon was upgraded to the separate species *L. praecipuus*. In contrast, Hebauer (1997) restored *L. eximius* from synonymy, but virtually interchanged the original Gentili & Chiesa's (1975) concept of both taxa, mentioning that *L. eximius* is “easy to confuse with the dark or totally black sympatric species *L. praecipuus*”. Hebauer (1997) also considered the distinguishing of both latter species by the morphology of male genitalia as difficult. The presented study revealed a third species similar to *L. eximius* and *L. praecipuus*, which is described above as *L. harteni* nov. spec. The detailed re-examination of male genitalia showed that all three taxa differ substantially in the morphology of the median lobe, concerning its ventral, lateral and dorsal aspects. Based on these differences, we consider *L. eximius*, *L. praecipuus* and *L. harteni* as well-defined separate species. However, a re-examination of type material is needed to confirm our application of species names of *L. eximius* and *L. praecipuus*. Because of the reconstruction of the Museum of Natural History in Paris, type specimens were not available to us at the moment. Therefore, we present here some diagnostic characters separating all three species occurring in the Arabian Peninsula, but their nomenclature has to be solved later.

Biology: Aquatic species; examined specimens were mostly collected at light.

Distribution: Because of revised taxonomic status, the general distribution of *L. praecipuus* and *L. eximius* has to be revised. In the Arabian Peninsula, *L. praecipuus* is widely distributed through most areas, but seems to be absent from higher altitudes, where it is replaced by *L. eximius*.

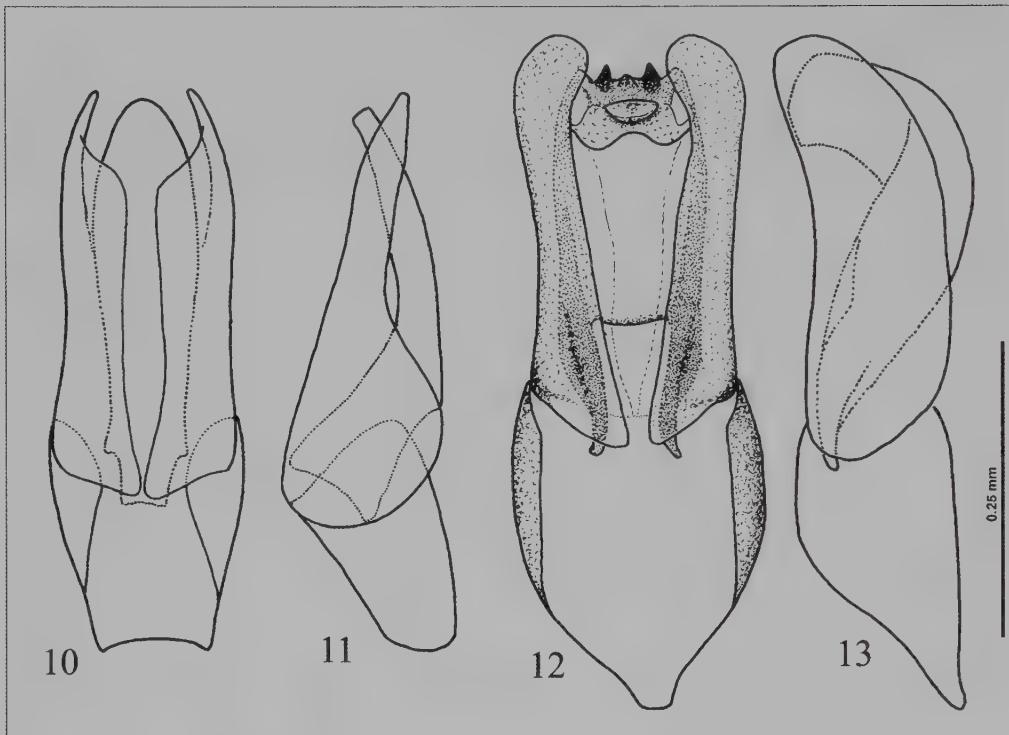
Genus *Paracymus* Thomson, 1867

The genus contains 81 small, rather uniformly looking species distributed world-wide. Only one species, *P. relaxus*, is known to occur in the Arabian Peninsula. This species is recorded by us also from the UAE. The genus was traditionally placed into the tribe Anacaenini. Based on a phylogenetic analysis of adult morphological characters, Komarek & Beutel (2007) showed that *Paracymus* does not belong to the Anacaenini and placed the genus into the tribe Laccobiini. However, the taxon sampling used by the latter authors was not adequate to decide about its phylogenetic position and some characters supporting this position were, moreover, misinterpreted (see e.g. Short, 2008). The phylogenetic position of *Paracymus* within the Hydrophilidae remains unclear.

Paracymus relaxus Rey, 1884

Plate 8

Specimens examined: Al-Ajban, 1♂, 2♀, 9.xi–7.xii.2005, MT & LT; 5 ex., 28.xii.2005–29.i.2006, LT; 4 ex., 2–9.iv.2006, LT; 82 ex., 6–22.v.2006, LT; 38 ex., 27.v–26.vi.2006, LT. NARC, near Sweihan, 1



Figures 10–13. Aedeagophores. 10–11: *Laccobius orsenigoi* Gentili; 12–13: *Arabhydrus gallagheri* Hebauer. (10, 12: ventral view; 11, 13: lateral view)

ex., 26.ii–2.iv.2006, LT. Wadi Safad, 1 ex., 2–26.i.2006, WT. Wadi Wurayah, 5♂, 44 ex., 18–25.iii.2007, MT.

Differential diagnosis: The species can be recognized from all other Arabian hydrophilids by its small body size (2.6–3.2 mm), uniformly dark dorsal colouration, dorsal side with sparse but coarse punctuation, elytra with sutural stria but lacking punctural series and five abdominal ventrites. It may resemble dark-coloured *L. eximus*, from which it differs by last two mentioned characters, and to *Arabhydrus*, from which it differ by smaller and much wider body. Externally, the representatives of *Paracymus* are rather similar to the genus *Anacaena*, Thomson, 1859, which was, however, not recorded from the Arabian Peninsula so far.

Biology: The specimens examined were collected at light or using Malaise traps. The species is aquatic, occurring in various kinds of standing waters and at least in the European localities it seems to prefer the saline biotopes.

Distribution: *P. relaxus* is widely distributed from Canary Islands through the Mediterranean and Near East to Tadjikistan and Turkmenistan. In the Arabian Peninsula, it was recorded from Saudi Arabia (Hebauer, 1997) and Yemen (Balfour-Browne, 1951); here we provide the first records from the UAE.

Tribe Hydrophilini Latreille, 1802

Subtribe Acidocerina Zaitzev, 1908

Genus *Agraphydrus* Régimbart, 1903

Representatives of *Agraphydrus* are among the smallest members of the Hydrophilini, ranging from 1.5–3.0 mm. In addition to their relatively small size and often brownish colouration, they may be distinguished by the absence of elytral sutural striae and the relatively straight second maxillary palpomere. There are currently 17 described species in the genus, primarily from the Old World tropics. (Hansen, 1999), although many more species await description (Hebauer, pers. comm.). Only a single species is known from the Arabian Peninsula; here it is recorded from the UAE for the first time.

Agraphydrus minutissimus (Kuwert, 1890)

Plate 13

Specimens examined: Bithnah, 1 ex., 2.ii–2.iii.2006, LT. Wadi Maidaq, 1 ex., 29.xi–22.xii.2005, LT. Wadi Safad, 2 ex., 21.ii–4.iii.2006, LT. Wadi Wurayah, 1 ex., 26.xi.2006, in water, leg. J.-L. Gattoliat.

Differential diagnosis: This relatively rare species may be distinguished from taxa in the subtribe by the combination of very small size, uniformly pale dorsal colouration, and all segments of the maxillary palps bowed inwards (the normal condition). It is most likely to be confused with *Enochrus*, particularly *E. tetraspilus*, but all members of this genus have the second maxillary palpomere bowed outward.

Biology: An aquatic species, four of the five UAE specimens were collected in light traps.

Distribution: Primarily an Arabian species, originally described from Syria and subsequently recorded from Saudi Arabia, Oman, and Yemen (Balfour-Browne, 1951; Hebauer, 1997).

Genus *Enochrus* Thomson, 1859

Representatives of this species-rich genus range in size and colour from small to medium, and pale brown to black. They may be distinguished by their distinctive outwardly-curved second maxillary palpomere. They also possess a sutural stria, whereas the genera *Helochares* and *Agraphydrus* do not, which most closely resemble this genus in the Middle East. There are presently slightly more than 200 described species in six subgenera in this large, cosmopolitan genus (Hansen, 1999; Short & Hebauer, 2006). A total of 11 species in two subgenera (*Methydrus* Rey, 1885, and *Lumetus* Zaitzev, 1908) are found in the Arabian Peninsula, with four species recorded here from the UAE.

Enochrus (Lumetus) politus (Küster, 1849)

Plate 15

Specimens examined: Al-Ajban, 2 ex., 15–22.v.2006, LT; 3 ex., 5–12.vi.2006, LT; 5 ex., 19–26.vi.2006, LT; 1 ex., 26.vi–2.vii.2006, MT. Fujairah, 2 ex., 13.xi–10.xii.2005, LT; 6 ex., 28.ii–1.iv.2006, LT; 1 ex., 1–8.iv.2006, LT; 2 ex., 15–22.iv.2006, LT; 2 ex., 20–27.v.2006, LT. Hatta, 1 ex., 22–29.i.2006, LT; 1 ex., 8–26.iv.2006, LT; 1 ex., 24–30.v.2006, LT; 2 ex., 17–24.viii.2006, LT. Khor al-Khawir, 3 ex., 2–13.v.2007, LT. Near Mahafiz, 1 ex., 24–30.v.2006, LT. Sharjah Desert Park, 7 ex., 22.ii–9.iii.2005, LT; 13 ex., 21.iii–29.iii.2005, LT; 11 ex., 20.x–8.xi.2005, LT; 29 ex., 18.i–25.ii.2006, LT; 16 ex., 17.ii–3.iii.2007, LT; 38 ex., 3–10.iii.2007, LT; 28 ex., 10–17.iii.2007, LT; 12 ex., 17–24.iii.2007, LT; 5 ex., 24.iii–1.iv.2007, LT; 11 ex., 8–15.iv.2007, LT; 4 ex., 15–22.iv.2007, LT; 8 ex., 5–12.v.2007, LT; 14 ex., 20.x–24.xi.2007, LT; 1 ex., 24.xi–22.xii.2007, LT; 2 ex., 25.v–15.vii.2008, LT; 1 ex., 30.i–3.iii.2009, LT. NARC, near Sweihan, 1 ex., 30.i–26.ii.2006, LT; 1 ex., 26.ii–2.iv.2006, LT. Wadi Bih dam, 4 ex., 24.iv–1.v.2007, LT; 1 ex., 30.v–5.vi.2007, LT. Wadi Safad, 1 ex., 2–26.i.2006, WT; 1 ex., 31.i–21.ii.2006, LT; 1 ex., 21.ii–4.iii.2006, LT; 19 ex., 15–22.iv.2006, LT; 20 ex., 14–21.v.2006, LT; 1 ex., 17–24.vi.2006, LT. Wadi Siji, 5 ex., 24.ix–12.x.2006, WT. Wadi Wurayah, 1 ex., 18–25.iii.2007, MT.

Differential diagnosis: Among Arabian members of *Enochrus*, this species can be easily distinguished by its comparatively large size, very dark brown colouration, and lack of an emargination of the fifth ventrite.

Biology: An aquatic species. Almost all specimens from UAE were collected in light traps.

Distribution: A relatively common and widespread Mediterranean species recorded along southern Europe (Spain, Portugal, Italy), northern Africa (Algeria, Egypt, Morocco, Tunisia), and reaching the Middle East (Israel, Lebanon, Oman, Syria, Afghanistan). It is also known from the Canary Islands and Madeira.

***Enochrus (Lumetus) segmentinotatus* (Kuwert, 1888)**

Plate 16

Specimens examined: Al-Ajban, 7 ex., 28.xii.2005–29.i.2006, LT; 1 ex., 1.iv–2.v.2006, MT; 40 ex., 5–12.vi.2006, LT; 24 ex., 19–26.vi.2006, LT; 1 ex., 26.vi–2.vii.2006, MT. Near Mahafiz, 1 ex., 29.xii.2005–7.i.2006, LT. Sharjah Desert Park, 1 ex., 24.xi–22.xii.2007, LT. Wadi Safad, 1 ex., 27.xi–22.xii.2005, LT. Wadi Wurayah, 5 ex., 18–25.iii.2007, MT.

Differential diagnosis: Among the Arabian members of *Enochrus*, this species can be distinguished by its large size, light brown to yellow colouration, and lack of an emargination of the fifth ventrite.

Biology: Aquatic species; UAE specimens were collected at light and in Malaise traps.

Distribution: Broadly distributed in the Palaearctic region, including Saudi Arabia. Also known from Gambia (Schödl, 1998; Hansen, 1999).

***Enochrus (Lumetus) sinuatus* d'Orchymont, 1937**

Plate 17

Specimens examined: Al-Ajban, 1 ex., 28.xii.2005–29.i.2006, LT; 1 ex., 26.ii–27.iii.2006, LT; 1 ex., 2–9.iv.2006, LT; 1 ex., 15–22.v.2006, LT; 23 ex., 5–12.vi.2006, LT; 1 ex., 19–26.vi.2006, LT. NARC, near Sweihan, 1 ex., 30.i–26.ii.2006, LT. Wadi Wurayah, 6 ex., 18–25.iii.2007, MT.

Differential diagnosis: In addition to its entirely pale coloured dorsum, *E. sinuatus* may be distinguished from other *Enochrus* species by its extremely long hind femora, which extend outward beyond the margin of the elytra when perpendicular to the body.

Biology: An aquatic species, almost all specimens from the UAE were collected in light traps.

Distribution: This species, rare in collections, was previously only known from Iran and Pakistan (Schödl 1998).

***Enochrus (Methydrus) cf. tetraspilus* (Regimbart, 1903)**

Plate 14

Specimens examined: Fujairah, 2 ex., 13.xi–10.xii.2005, LT. Sharjah Desert Park, 1 ex., 20.x–8.xi.2005, LT; 5 ex., 18.i–25.ii.2006, LT.

Differential diagnosis: As the smallest member (3.0–3.5 mm) of *Enochrus* recorded from the UAE, it is unlikely to be confused with other species recorded here.

Remarks: The examined specimens are very similar to *E. tetraspilus* in most characters (including size, colouration, and genitalia), but differ in that the abdominal emargination appears smaller, the ventral margin of the mesoventral keel is slightly more straight, the elytral ground punctuation is more strongly impressed. Due to these differences, we refrain from making a positive identification at the present time.

Genus *Helochares* Mulsant, 1844

As with the genus *Enochrus*, representatives of this genus range in size and colour from small to medium and pale brown to black. They may be distinguished by their usually long, inwardly curving maxillary palps and lack of a sutural stria; other characteristics of this cosmopolitan genus vary widely among species. There are currently 173 described species distributed in five subgenera (Hansen, 1999; Short & Hebauer, 2006). Three of these are known from the Arabian Peninsula (Hebauer, 1997): *H. (Hydrobaticus) andreinii* d'Orchymont, 1939, *H. (Hydrobaticus) crenatuloides* d'Orchymont, 1943, and *H. (s. str.) pallens* (McLeay, 1825). Only *H. crenatuloides* is here recorded from the United Arab Emirates.



Plates 13–14. 13: *Agraphydrus minutissimus* Kuwert; 14: *Enochrus* cf. *tetraspilus* (Régimbart).

Helochares (Hydrobaticus) crenatuloides d'Orchymont, 1943

Plate 18

Specimens examined: Hatta, 1 ex., 24–30.v.2006, LT; 3 ex., 16–30.viii.2006, LT. Al-Hayl, 1 ex., 3.xii.2006, in water, leg. J.-L.Gattoliat. Near Mahafiz, 1 ex., 27.xi–1.xii.2005, PT & WT. Sharjah Desert Park, 2 ex., 25.ii–25.iii.2006, LT; 1 ex., 17.ii–3.iii.2007, LT; 1 ex., 24.iii–1.iv.2007, LT; 12 ex., 25.v–15.vii.2008, LT. Wadi Bih dam, 1♂, 19.ii–29.iii.2007, LT; 3 ex., 9–23.vii.2008, LT. Wadi Maidaq, 7 ex., 29.vii–26.viii.2006, MT. 1 ex., Wadi Safad, 17–24.vi.2006, LT.

Differential diagnosis: This species is diagnosed by the presence of coarse elytral punctures and the shape of the aedeagus (figured by d'Orchymont (1943)).

Biology: An aquatic species; UAE specimens were collected at light and Malaise traps.

Distribution: Previously only known from India and Oman (Hebauer, 1997; Hansen, 1999).

Subtribe **Hydrophilina** Latreille, 1802

Genus *Sternolophus* Solier, 1834

Representatives of this genus are relatively large, black, and possess a fused sternal keel along the centre of the meso- and metaventrites. They are not easily confused with any other hydrophilids known from the UAE, although two other large sternal-keel bearing hydrophilid genera (*Hydrophilus* Geoffroy, 1762, and *Hydrochara* Berthold, 1827) are known from the Arabian Peninsula; however, both these genera are larger (sometimes much larger) in body size. There are nine described species of *Sternolophus* distributed primarily in the Old World



2 mm



Plates 15–18. 15: *Enochrus politus* (Küster); 16: *Enochrus segmentinotatus* (Kuwert); 17: *Enochrus sinuatus* d'Orchymont; 18: *Helochares crenatuloides* d'Orchymont.

tropics, although some extend into the southern and extreme eastern Palearctic Region (Hansen, 1999). *Sternolophus decens* Zaitzev, 1909, and *S. solieri* Castelnau, 1840, are known from the Arabian Peninsula, with the former recorded here from the UAE for the first time.

***Sternolophus* (s. str.) *decens* Zaitzev, 1909**

Plate 19

Specimens examined: Fujairah, 2 ex., 20–27.v.2006, LT. Hatta, 1 ex., 17–28.iii.2006, LT. Near Mahafiz, 2 ex., 21–28.viii.2006, LT. Sharjah-Khor Kalba, near tunnel, 3 ex., 31.v–7.vi.2006, LT. Wadi Maidaq, 2 ex., 2–16.ii.2006, LT; 2 ex., 27.iv–4.v.2006, LT; 1 ex., 29.vii–26.viii.2006, MT. Wadi Safad, 1 ex., 2–26.i.2006, WT; 1 ex., 31.i–21.ii.2006, LT; 2 ex., 21.ii–4.iii.2006, LT. Wadi Wurayah farm, 1 ex., 15.i–22.ii.2009, LT.

Differential diagnosis: This species can be distinguished by the unicoloured metafemora, and the length of the sternal spine, which extends posteriorly over the abdomen to the anterior margin of the second ventrite.

Biology: An aquatic species; most specimens examined were collected at light.

Distribution: This species has previously been recorded from the Arabian Peninsula (Saudi Arabia, Oman, Yemen) as well as Iran and India (Balfour-Browne, 1951; Hebauer, 1997; Hansen, 1999).

Subfamily **Sphaeridiinae** Latreille, 1802

Tribe **Coelostomatini** Heyden, 1891

Genus ***Coelostoma*** Brullé, 1835

The representatives of the genus are easily recognizable according to the medium to large body size, black and rather convex body and the elytra lacking serial punctures or longitudinal striae except of sutural stria (Plates 21–22). Up to now, 104 species have been described from Afrotropical, Palaearctic and Oriental regions (Hansen, 1999; Short & Hebauer, 2006). Three species have been recorded from the Arabian Peninsula: *C. horni* (Régimbart, 1902), *C. stultum* (Walker, 1858) and *C. transcaspicum* Reitter, 1906. The two latter species are recorded here also for the UAE.

***Coelostoma (Holocoelostoma) stultum* (Walker, 1858)**

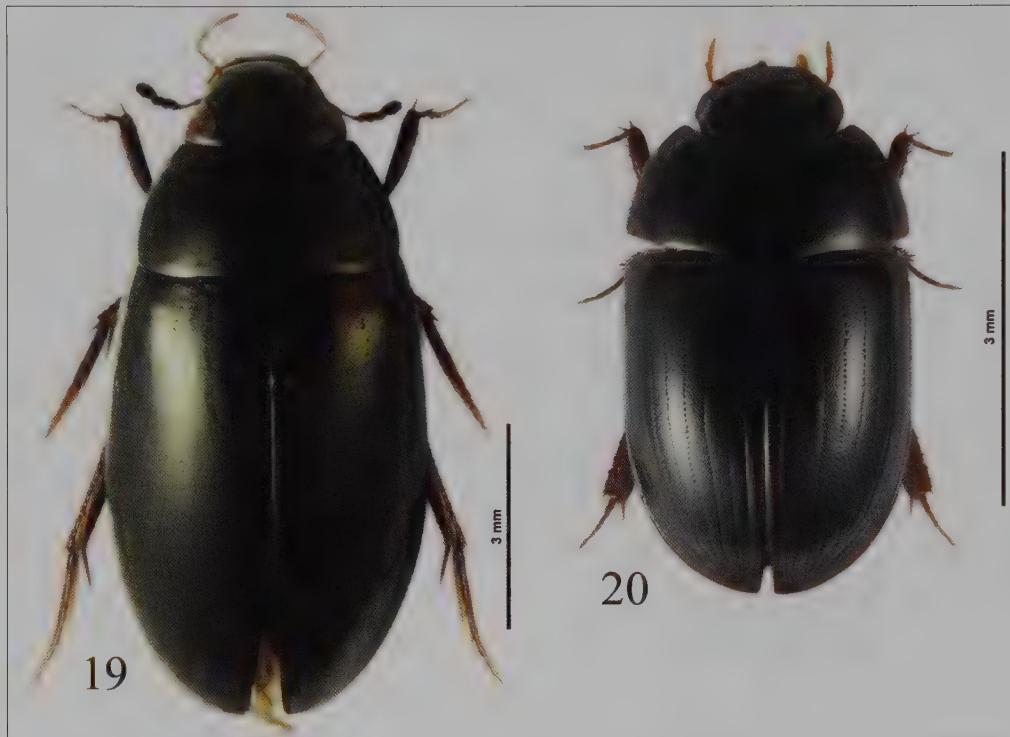
Plates 22–23

Specimens examined: Al-Ajban, 1♀, 19–26.vi.2006, LT. Fujairah, 1♂, 13.xi–10.xii.2005, LT; 1♂, 28.ex., 28.ii–1.iv.2006, LY; 4 ex., 1–8.iv.2006, LT; 6 ex., 15–22.iv.2006, LT; 11 ex., 20–27.v.2006, LT; 1 ex., 10–17.vi.2006, LT. Wadi Safad, 1 ex., 27.xi–20.xii.2005, LT; 1♂, 2 ex., 20.xii.2005–2.i.2006, LT.

Differential diagnosis: Easily recognizable from other Arabian *Coelostoma* species by the small body size (Plate 22), mesofemora lacking hydrofuge pubescence (i.e. covered only by sparsely distributed stiff setae) and small, wide aedeagus with simply rounded apex of the median lobe and the corona situated apically (Plate 23). In external habitus and body size, the species is very similar to *C. horni*. The latter species differs from *C. stultum* by trilobed apex of the median lobe (Plate 24) and mesofemora covered by dense hydrofuge pubescence.

Biology: Most specimens examined were collected at light; details on the bionomy are not available. The species is probably aquatic, similarly as many other species of the genus *Coelostoma*.

Distribution: Widely distributed Oriental species reaching from south-western Asia to Japan and South Korea and to Arabian Peninsula (Oman, Saudi Arabia, UAE). Eastwards, it reaches



Plates 19–20. 19: *Sternolophus decens* Zaitzev; 20: *Dactylosternum abdominale* Fabricius.

as far as to Sumbawa Island. It was also recorded from Andaman Islands, Nicobar Islands and Mascarene Islands (Hansen, 1999).

***Coelostoma (Lachnocoelostoma) transcaspicum* Reitter, 1906**

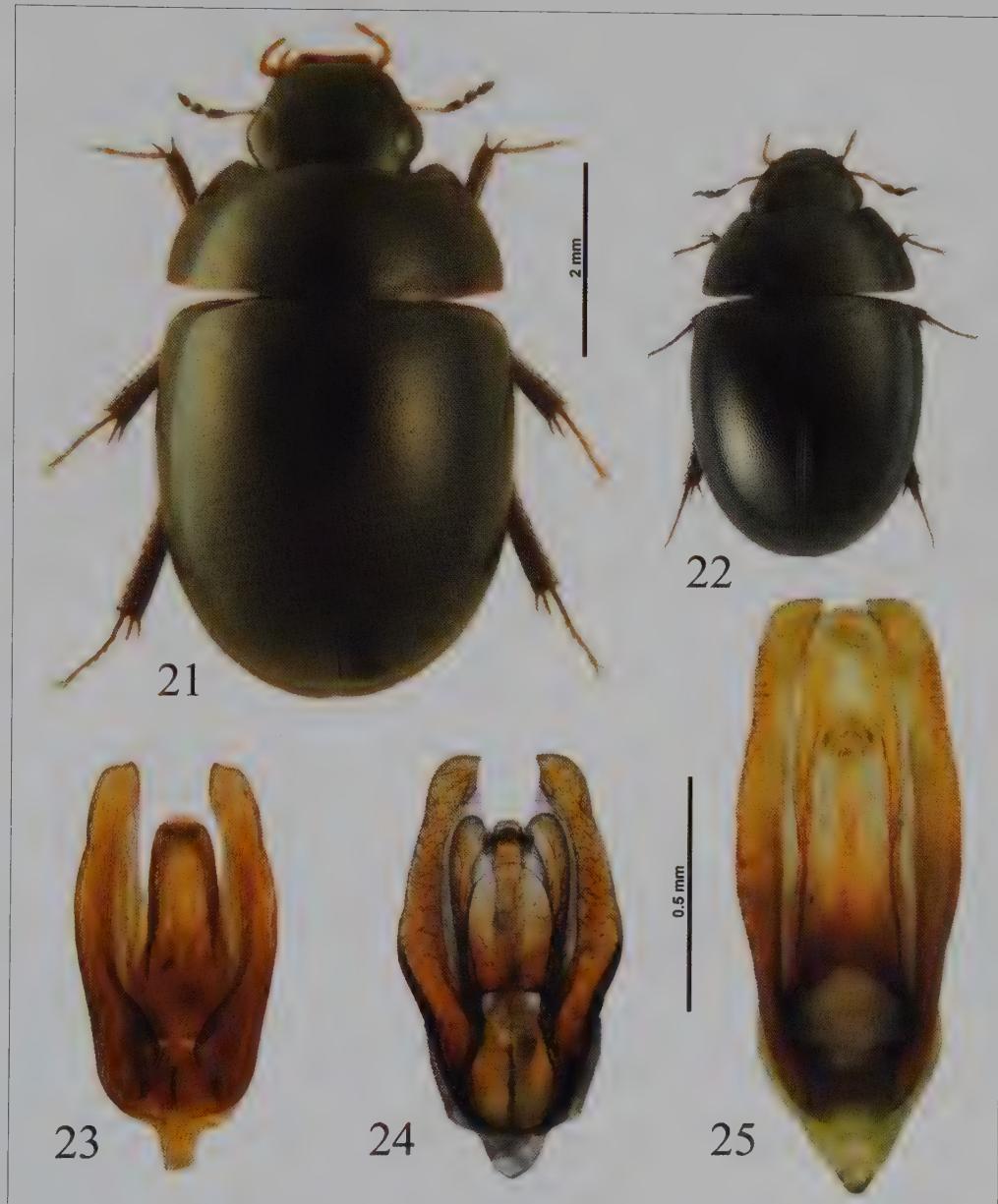
Plates 21, 25
Specimens examined: Sharjah-Khor Kalba, near tunnel, 2 ex., 24–30.v.2006, LT. Wadi Maidaq, 1 ex., 27.iv–4.v.2006, LT. Wadi Safad, 1♀, 21.ii–4.iii.2006, LT. Wadi Shawkah, 1♂, 1 ex., 20.iii.2007, leg. J. Batelka. Wadi Wurayah, 1 ex., 26.xi.2006, in water, leg. J.-L. Gattoliat. Wadi Wurayah farm, 2 ex., 8–15.iii.2009, LT.

Differential diagnosis: The species is easily distinguishable from remaining Arabian *Coelostoma* species by considerably larger body (Plate 21) and narrow, elongate aedeagus with the median lobe simply rounded apically and the corona situated in apical 0.25 of the median lobe (Plate 25). From *C. stultum* it can be separated also by dense hydrofuge pubescence covering the anterior part of mesofemora.

Remarks: The identification was clarified by comparison with the type specimen housed in the d'Orchymont collection (Institut Royal des Sciences naturelles de Belgique, Brussels, Belgium).

Biology: Aquatic to hygroscopic species. In Iran, the species occurs in the algae and rotting plant remains at the edges of streams (J. Hájek, pers. comm.), in Turkey it was recorded in hot springs (Mart et al., 2006). Most of the material from UAE was collected at light.

Distribution: Palaearctic species occurring from eastern Turkey through Iran to Tajikistan, Turkmenistan and Uzbekistan, southwards reaching northern part of the Arabian Peninsula



Plates 21–25. Arabian *Coelostoma*. 21, 25: *Coelostoma transcaspicum* Reitter; 22–23: *Coelostoma stultum* (Walker); 24: *Coelostoma horni* (Régimbart) (W Yemen, Jabal Bura, coll. NMPC). 21–22: Habitus; 23–25: Aedeagus.

(Oman, Saudi Arabia) (Hebauer, 1997; Hansen, 1999; Ryndevich, 2004; Mart et al., 2006). Records from Oriental region (China, Laos, Vietnam, peninsular Malaysia) are probably based on misidentification and need confirmation (Balfour-Browne, 1951).

Genus *Dactylosternum* Wollaston, 1854

The representatives of the genus can be recognized by the combination of the following characters: medium to large body size (over 5 mm), elytra bearing longitudinal striae, bases of antennae concealed under lateral parts of clypeus, and body colouration black. Up to now, 71 species have been described from all biogeographical regions. Three species have been recorded from the Arabian Peninsula: *D. abdominale* (Fabricius, 1792), *D. depressum* (Klug, 1833) and *D. arabicum* Balfour-Browne, 1951. One of these species is recorded here also from the UAE.

Dactylosternum abdominale (Fabricius, 1792)

Plate 20

Specimens examined: Fujairah, 1♂, 1–8.iv.2006, LT.

Differential diagnosis: In contrast to *D. arabicum*, *D. abdominale* bears compact antennal club, carinate first abdominal ventrite and more depressed and parallel-sided body. In all these characters, *D. abdominale* agrees with *D. depressum*, from which it could be distinguished by smaller body size (3.8–5.0 mm), less impressed elytral series and characteristic aedeagus with apically widened parameres (Smetana, 1978, Fig. 22).

Biology: The species inhabit all kinds of decaying organic, especially plant matter. The records from the excrements are, however, very rare (Smetana, 1978).

Distribution: The species is widely distributed throughout the tropics and subtropics all over the world; rarely it also reaches the adjacent temperate areas (Smetana, 1978; Hansen, 1999).

Tribe Megasternini Mulsant, 1844

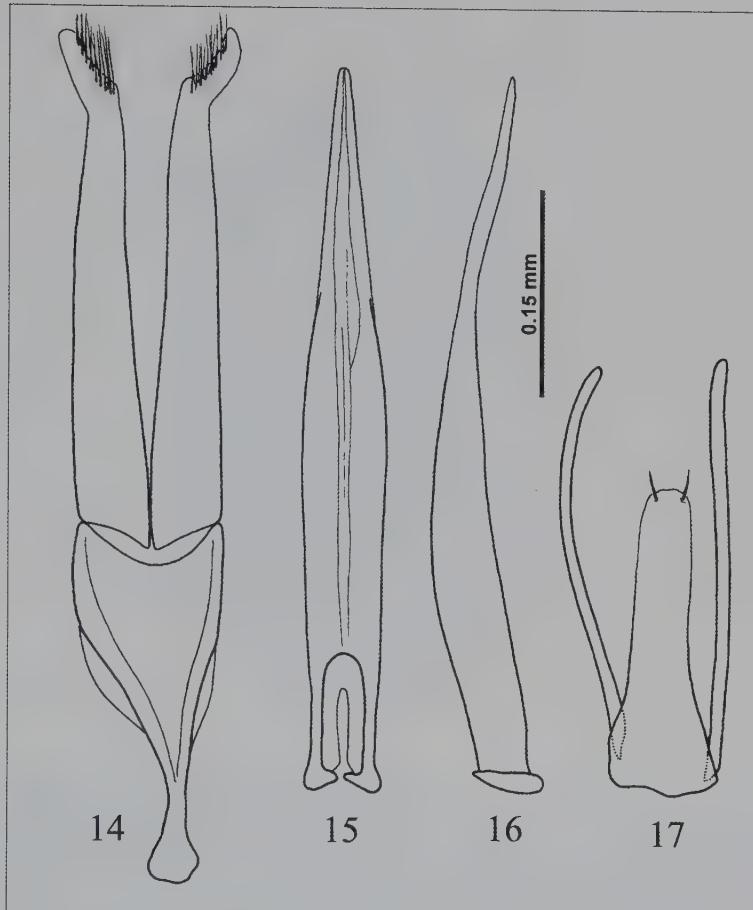
Genus *Cercyon* Leach, 1817

The representatives of the genus *Cercyon* are very variable in general habitus, but they can be easily distinguished from remaining megasternine genera occurring in the Arabian Peninsula (*Cryptopleurum* Mulsant, 1844, *Emmidolium* d'Orchymont, 1937, and *Pachysternum* Motschulsky, 1863) by pronotum without deep longitudinal impressions, antennal grooves not reaching the lateral margins of prothorax, and preepisternal elevation of mesothorax in form of narrowly elongate plate or sharp longitudinal keel (for further differential characters see Hansen (1991) and Fikáček & Boukal (2004)). More than 250 species of the genus are known from all zoogeographical regions (Hansen, 1999; Short & Hebauer, 2006). Hebauer (1997) recorded three species from the Arabian Peninsula (*Cercyon nigriceps* (Marsham, 1802), *C. quisquilius* (Linnaeus, 1761) and *C. subsolanus* Balfour-Browne, 1939) along with one unidentified species. In this paper, we recorded three species of *Cercyon* from the UAE, of which one is new to Arabian Peninsula and one is new to science.

Cercyon (Cercyon) deserticola Fikáček, Gentili & Short nov. spec.

Plates 26–29, Figures 14–17

Specimens examined: Holotype: ♂, Fujairah, 8.xii.2005–2.i.2006, light trap, leg. A. van Harten, coll. NMPC. Paratypes: 1♂, 1 ex., same data as holotype. 2♂, 6 ex., same locality but 13.xi–10.xii.2005, LT; 5♂, 40 ex., 28.ii–1.iv.2006, LT; 48 ex., 1–8.iv.2006, LT; 1♂, 28 ex., 8–29.iv.2006, LT; 1♂, 18 ex., 20–27.v.2006, LT; 1 ex., 10–17.vi.2006, LT. 6 ex., Bithnah, 31.xii.2005–2.ii.2006, LT; 1 ex., 4–26.iii.2006, LT. 5 ex., Hatta, 22–29.i.2006, LT; 14 ex., 30.i.–26.ii.2006, LT; 1♂, 21 ex., 4–26.iv.2006, LT; 1 ex., 17–24.v.2006, LT; 3 ex., 16–30.viii.2006, LT. 2♂, 2 ex., near Mahafiz, 10–29.xii.2005, LT; 5 ex., 29.xii.2005–7.i.2006, LT; 2 ex., 2.ii–2.iii.2006, LT; 13 ex., 21–28.iii.2006, LT; 1 ex., 4–11.iv.2006, LT; 3 ex., 19–26.iv.2006, LT. 1 ex., Sharjah Desert Park, 21–29.iii.2005, LT; 4 ex., 18.i–25.ii.2006, LT; 1♂, 2 ex., 25.ii–25.iii.2006, LT; 1 ex., 21.xii.2006–23.i.2007, LT; 1 ex., 8–15.iv.2007, LT; 1 ex., 25.v–15.vii.2008, LT. 1 ex., Sharjah-Khor Kalba, near tunnel, 31.v–7.vi.2006, LT; 1 ex., 7–14.vi.2006, LT. 1



Figures 14–17. *Cercyon deserticola* nov. spec., male genitalia of the holotype. 14: Tegmen; 15: Median lobe, dorsal view; 16: Median lobe, lateral view; 17: Sternite 9.

ex., NARC, near Sweihan, 16.xi–21.xii.2005, LT. 2 ex., Wadi Bih dam, 19.ii–29.iii.2007, LT. 1♂, 3 ex., Wadi Maidaq, 27.xi–22.xii.2005, LT; 3 ex., 22.xii.2005–2.ii.2006, LT; 3 ex., 27.iv–4.v.2006, LT; 1 ex., 6–13.v.2006, LT. 1 ex., Wadi Safad, 31.i–21.ii.2006, LT; 1 ex., 21.ii–4.iii.2006, LT; 1 ex., 15–22.iv.2006, LT. 1 ex., Wadi Wurayah farm, 1–8.iv.2009, LT.

Differential diagnosis: *C. deserticola* can be distinguished from all *Cercyon* species known to us by the following combination of characters: body small (1.45–2.00 mm); elytra brown with pale apical portion (Plate 26); femoral lines present; preepisternal plate 2.2–3.8× longer than wide, with concave surface (Plates 27–28); apical portion of parameres membranous, everted laterad, bearing dense row of long setae (Fig. 14).

There are only few other *Cercyon* species characterized by small body size and presence of femoral lines, all of them classified into the *C. haemorrhoidalis* and *C. nigriceps* species groups (Balfour-Browne, 1958; Smetana, 1978): *C. pygmaeus* (Illiger, 1801), *C. nigriceps* (Marsham, 1802), *C. minax* Balfour-Browne, 1958 and two undescribed species from the Russian Far East and Cameroon (F. Hebauer, pers. comm.). All mentioned species except *C. pygmaeus* differ from *C. deserticola* by very narrow preepisternal plate (8–10× longer than

wide). *C. pygmaeus* also has slightly narrower preepisternal plate ($3.9 \times$ longer than wide) and the plate is flat, without concave median part (in contrast, preepisternal plate is concave in *C. deserticola*).

In morphology of male genitalia, *C. deserticola* seems to be rather similar to *C. pygmaeus* and *C. terminatus* (Marsham, 1802) in possessing long, narrow parameres with row of long setae on apex and in posteriorly widened manubrium. However, median lobes of both these species are broader and bluntly rounded at apex and apices of parameres are not everted laterad. Genitalia of *C. nigriceps* also bear tuft of setae on apex of the paramere, and median lobe is of similar shape to that of *C. deserticola*. However, the manubrium is not widened posteriad and apices of parameres are not everted laterad.

In addition to the mentioned species, *C. tachyoryctidis* Jeannel & Paulian, 1945, described from the *Tachyoryctes* (Mammalia: Spalacidae) burrows in Ethiopia, seems to be rather similar to *C. deserticola*, even though it is not clear from the original description whether this species bears femoral lines of metaventrite. We had no opportunity to examine the type specimens of the latter species, but Jeannel & Paulian (1945) provided a detailed drawing of male genitalia in their description which disagrees with those of *C. deserticola* (apical portion of the paramere is not everted, bears only four setae on apex, median lobe is wider and manubrium of the phallobase is not widened posteriorly in *C. tachyoryctidis*).

Description: Body elongate oval, maximum width in anterior 0.4 of elytra; elytra narrowed posteriad, moderately and evenly convex in lateral view. Length 1.45–2.00 mm (holotype 1.45 mm); width 0.90–1.20 mm (holotype 0.90 mm).

Colouration (Plate 26). Head dark brown to black; anterior margin of clypeus reddish. Pronotum rufotestaceous, with slightly darker median and posterolateral spots, lateral margins and anterolateral corner paler, yellowish. Elytra rufotestaceous, intervals 2–7 with slightly darker spot between in posterior 0.5; apical part of elytra with pale yellowish spot reaching posterior 0.15 on intervals 2–6 and posterior 0.35 on intervals 7–9; epipleuron pale, yellowish. Ventral side of prothorax reddish brown; head, meso- and metaventrite dark brown, median part of preepisternal plate reddish; abdominal ventrites dark brown with reddish posterior margins. Femora brown, tibiae, tarsi, antennae and mouthparts pale rufotestaceous.

Head. Clypeus with fine, not very dense punctation, punctures crescent-like; intervals without microsculpture; anterior margin straight, narrowly rimmed. Vertex with punctation similar to that on clypeus, punctures slightly larger, narrowly crescent-like; intervals without microsculpture. Eyes large, separated by $6 \times$ width of one eye. Mentum wider than long; anterior margin narrowly rimmed, slightly convex, with a very shallow emargination medially; surface with sparsely distributed, rounded punctures, interstices without microsculpture (Plate 29). Maxillary palpomere 2 as long as palpomere 4, swollen apically; palpomere 3 slightly shorter than palpomere 4; palpomere 4 spindle-like. Antenna with 9 antennomeres; scapus ca. as long as antennal club; antennomeres 2–6 combined ca. $0.5 \times$ as long as scapus; antennal club widely elongate oval, antennomere 9 blunt at apex, constricted subapically.

Prothorax. Pronotum arcuately narrowed anteriad, widest at posterior angles; lateral margins evenly rounded (as in *C. terminatus*; see Hansen (1987), Fig. 240), finely rimmed; punctation sparse, consisting of moderately sized, sharply impressed, narrowly crescent-like transverse punctures; intervals without microsculpture. Prosternum carinate medially, cut off (i.e. without notch) posteromedially; lateral portions indistinctly divided from mesal portion; mesal portion bearing sparse long setae. Antennal grooves well developed, rather large; hypomeron bearing sparse long setae.



26

0.5 mm

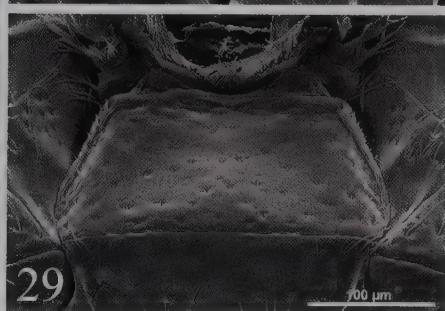


27

200 µm



28



29

100 µm

Plates 26–29. *Cercyon deserticola* nov. spec. 26: General habitus; 27: Preepisternal plate and metaventrite, ventral view; 28: Preepisternal plate, ventrolateral view; 29: Mentum.

Mesothorax. Scutellar shield small, slightly longer than wide, bearing a few very fine punctures. Elytron with 10 punctural series (including sutural series); series 1–5 reaching elytral base, series 6, 7 and 10 arising subbasally, series 8–9 arising in anterior 0.15 of elytral length; series 2 and 9 joining at elytral apex, series 3 and 8 joining subapically, series 4 and 5 reaching apical 0.2, series 5 and 6 apical 0.3 of elytral length, series 10 reaching elytral midlength; series 1–9 finely impressed except for basal parts and portions at elytral apex, series 10 not impressed; serial punctures rounded, moderately large, sparsely distributed. Elytral intervals flat medially, becoming slightly convex laterad; interval punctuation very fine and sparse; interstices without microsculpture. Epipleuron ca. as wide as pseudoepipleuron basally, narrowing posteriad to level of metathorax. Preepisternal plate 2.2× longer than wide, slightly overlapping anterior margin of metaventre; surface concave, sparsely punctate, interstices without microsculpture. Grooves for reception of procoxae shallow.

Metathorax. Metaventre with median elevated pentagonal portion lacking pubescence and microsculpture, bearing rather dense punctuation consisting of moderately sized, slightly rasp-like punctures. Anterolateral ridges reaching anterolateral corner along the posterior margin of mesocoxal cavity. Femoral lines present, well distinct, almost reaching anterolateral corner of metaventre. Anepisternum 3 narrow, 10× longer than wide.

Legs short, tibiae slightly longer than femora. Apex of anterior femur without cleft, outer margin with 6 stout and 2 fine setae. Protarsomeres 2 and 3 much longer and slightly thicker than remaining ones.

Abdomen. Abdominal ventrite 1 with strong median carina, anterior part of ventrite 1 with fine longitudinal ridges. Ventrites 2–5 smooth, without ridges.

Male genitalia (Figs 14–17). Parameres 1.5× longer than phallobase, only very slightly narrowing from base apicad; apical 0.15 membranous, everted laterad, with dense series of long setae on inner margin. Phallobase slightly asymmetrical, with rather long, posteriorly widened manubrium. Median lobe ca. 0.85× as long as parameres and phallobase combined; slightly widened from base to anterior 0.45, narrowed into long pointed apex more apically; Sternite 9 tongue-like, membranous in apical portion, bearing two small setae on apex.

Variability: Rather variable species, varies especially in colouration and shape of preepisternal plate. Preepisternal elevation of some specimens is narrower than described above, and in fact the length/width ratio varies between 2.2 and 3.8. Rarely, the preepisternal plate is flat or only very slightly concave. Colouration of the examined specimens is often paler than of Plate 26, with uniformly pale elytra and pronotum and slightly darker head or with pale elytra possessing indistinct darker spot at midlength. As many of the specimens examined could be at least slightly teneral (teneral specimens are mostly attracted at light in many Hydrophilidae, Fikáček, pers. observ.), it is difficult to assess whether the observed colour variation really represents normal variability. Male genitalia do not exhibit any significant differences in all specimens examined.

Biology: All specimens were collected in light traps in the desert areas from sea level to 450 m a.s.l. No more details are known about the biology of this species.

Distribution: The species is known only from several localities situated in north-eastern part of the UAE, where it seems to be quite common. A wider distribution (at least in Oman) can be expected.

Etymology: Derived from Latin ‘desertum’ (desert, wasteland) and ‘incola’ (inhabitant), standing as noun in apposition.

Cercyon (Cercyon) quisquilius (Linnaeus, 1761)

Plate 30

Specimens examined: Al-Ajban, 2 ex., 9.xi–7.xii.2005, MT & LT; 20 ex., 28.xii.2005–29.i.2006, LT; 2 ex., 2–9.iv.2006, LT; 4 ex., 15–22.v.2006, LT; 15 ex., 5–12.vi.2006, LT. Bithnah, 36 ex., 31.xii.2005–



Plates 30–32. 30: *Cercyon quisquilius* Linnaeus; 31: *Cercyon lineolatus* (Motschulsky); 32: *Emnidolum excavatum* d'Orchymont.

2.ii.2006, LT. Fujairah, 9 ex., 13.xi–10.xii.2005, LT: 37 ex., 28.ii–1.iv.2006, LT; 10 ex., 1–8.iv.2006, LT; 24 ex., 8–29.iv.2006, LT; 26 ex., 20–27.v.2006, LT. Hatta, 73 ex., 22–29.i.2006, LT; 10 ex., 17–28.iii.2006, LT; 5 ex., 4–11.iv.2006, LT; 3 ex., 11–26.iv.2006, LT; 1 ex., 24–30.v.2006, LT; 2 ex., 16–30.viii.2006, LT. Near Mahafiz, 7 ex., 22–29.xii.2005, LT; 15 ex., 29.xii.2005–7.i.2006, LT; 1 ex., 2.ii–2.iii.2006, LT; 2 ex., 4–11.iv.2006, LT. Sharjah Desert Park, 6 ex., 22.ii–9.iii.2005, LT; 6 ex., 21–29.iii.2005, LT; 11 ex., 20.x–8.xi.2005, LT; 6 ex., 13.xi–11.xii.2005, LT; 20 ex., 18.i–25.ii.2006, LT; 26 ex., 25.ii–25.iii.2006, LT; 2 ex., 21.xii.2006–23.i.2007, LT; 15 ex., 17.ii–3.iii.2007, LT; 10 ex., 3–10.iii.2007, LT; 2 ex., 10–17.iii.2007, LT; 5 ex., 17–24.iii.2007, LT; 5 ex., 24.iii–1.iv.2007, LT; 6 ex., 8–15.iv.2007, LT; 3 ex., 20.x–24.xi.2007, LT; 1 ex., 24.xi–22.xii.2007, LT; 4 ex., 30.i–3.iii.2009, LT. NARC, near Sweihan, 4 ex., 16.xi–21.xii.2005, LT; 7 ex., 30.i–26.ii.2006, LT; 14 ex., 26.ii–2.iv.2006, LT. Wadi Bih dam, 9 ex., 19.ii–29.iii.2007, LT. Wadi Midaq, 12 ex., 27.xi–22.xii.2005, LT; 2 ex., 22.xii.2005–2.ii.2006, LT; 8 ex., 2–16.ii.2006, LT; 1 ex., 27.iv–4.v.2006, LT; 1 ex., 1–8.vii.2006, LT. Wadi Safad, 27 ex., 27.xi–22.xii.2005, LT; 2 ex., 20.xii.2005–2.i.2006, LT; 2 ex., 31.i–21.ii.2006, LT; 2 ex., 21.ii–4.iii.2006, LT. Wadi Wurayah, 1 ex., 18–25.iii.2007, MT. Wadi Wurayah farm, 3 ex., 22.ii–2.iii.2009, LT; 1 ex., 15–30.iii.2009, LT.

Differential diagnosis: Easily distinguishable from other Arabian *Cercyon* by general colouration (pale elytra, black pronotum with widely pale lateral margins and black head, see Plate 30), absence of femoral lines on the metaventrite and preepisternal elevation of mesothorax in form of narrow plate. Body length 1.8–2.6 mm.

Biology: In Europe and North America, the species inhabits excrement of various herbivorous mammals (cows, horses, sheep) and frequently occurs also in various kinds of decaying organic matter (e.g. compost piles) (Smetana, 1978; Hansen, 1987; Boukal et al., 2008). All listed specimens from the UAE were collected at light.

Distribution: Widely distributed Palaearctic species introduced also to the Nearctic, Neotropical, Australian and Pacific Regions, therefore at present is has a nearly cosmopolitan distribution (Hansen, 1999).

Cercyon (Clinocercyon) lineolatus (Motschulsky, 1863)

Plate 31

Specimens examined: Sharjah Desert Park, 1 ex., 17.ii–3.iii.2007, LT. Wadi Bih dam, 1 ex., 19.ii–29.iii.2007, LT. Wadi Siji, 2 ex., 24.ix–12.x.2006, WT.

Differential diagnosis: *C. lineolatus* is easily distinguishable from all Arabian representatives of the genus by its large body size (3.8–4.5 mm), dark pronotum, black elytral striae and yellow stripes on elytral intervals, rather small antennal grooves, preepisternal elevation of mesothorax bearing very narrow longitudinal plate, and metaventrite lacking femoral lines. By the laterally protruding eyes and very narrow preepisternal elevation of mesothorax it slightly resembles *C. subsolanus*, which is, however, much smaller (2.4 mm), bears pale pronotum and elytra without any trace of dark longitudinal stripes, and the preepisternal elevation forms sharp longitudinal keel instead of narrow plate.

Biology: According to Bameul (1986), *C. lineolatus* is coprophilous species inhabiting cow and rabbit excrement. The specimens from UAE were collected at light or in water traps.

Distribution: Oriental species distributed in India, Sri Lanka and south-eastern Asia (Vietnam), eastwards reaching Sumatra and Philippines, westwards the Arabian Peninsula. Vinson (1958) recorded it also from Mauritius Is., Bameul (1986) from Reunion Is.

Genus *Emmidolium* d'Orchymont, 1937

Monotypic genus. The only species, *E. excavatum*, was recorded recently by Fikáček (2007) for the first time for the Arabian Peninsula.

***Emmidolium excavatum* d'Orchymont, 1937**

Plate 32

Specimens examined: NARC, near Sweihan, 1♀, 29.xii.2005–22.i.2006, LT. Sharjah Desert Park, 1♂, 6–30.iv.2005, LT; 2 ex., 14.ii–1.iv.2008, LT.

Differential diagnosis: Very small species (1.2–1.4 mm), easily recognizable by three deep longitudinal depressions on pronotum. For detailed description see Orchymont (1937), Hori & Satô (2002) or Fikáček (2007).

Biology: Coprophilous species inhabiting excrement of large herbivorous mammals (cows, buffalos, elephants).

Distribution: Widely distributed throughout tropical regions of Old World, so far recorded from southeast Asia, Arabian Peninsula and Africa. Known records were summarized by Fikáček (2007); Hebauer (2006) recorded it from Kenya.

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Order Coleoptera, family Histeridae (Part 2)

Piet Kanaar

INTRODUCTION

Since the publication of my contribution to the first volume of the ‘Arthropod fauna of the UAE’ (Kanaar, 2008), almost 1000 further specimens have been sent to me for identification. The results are reported here. For general information about the Histeridae and the methods used the reader is referred to the chapter in the first volume.

MATERIALS AND METHODS

If not otherwise indicated, the specimens were collected by A. van Harten. They have been divided between the UAE Invertebrate Collection and the collection of the Nationaal Natuurhistorisch Museum (Naturalis), Leiden, Netherlands.

Abbreviations used: LT = light trap, MT = Malaise trap, PT = pitfall trap, WT = water trap, NARC = National Avian Research Centre.

SYSTEMATIC ACCOUNT

Subfamily **Histerinae** Gyllenhal, 1808

Tribe **Platysomatini** Bickhardt, 1914

Platylister (Popinus) simeani (Mulsant & Godart, 1875)

Specimens examined: Wadi Safad, 1 ex., 15–22.iv.2006, LT. Wadi Wurayah, 1 ex., 18.iii–16.iv.2007, MT.

Kanaarister spec.

Plate 1

Specimens examined: Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT.

Diagnosis: The length of the single specimen is 2.8 mm.

Remarks: The specimen has been seen by Mazur, who confirmed the attribution to the genus *Kanaarister* Mazur, 2000. Species of this genus resemble those of *Platysoma* Leach, 1817, but are very small and rather flat. Probably they live under bark or in leaf-sheaths. This is the first record for the Arabian peninsula of a *Kanaarister*-species. The species could be new to science, but as only one specimen has been collected, it is not described here.

Subfamily **Dendrophilinae** Reitter, 1909

Tribe **Paromalini** Reitter, 1909

Carcinops troglodites (Paykull, 1811)

Specimens examined: Sharjah Desert Park, 1 ex., 27.vii–14.viii.2008, LT.

Platylomalus digitatus (Wollaston, 1867)

Specimens examined: Bithnah, 2 ex., 4–26.iii.2006, LT. Sharjah Desert Park, 1 ex., 17.ii–3.iii.2007, LT; 1 ex., 24.iii–1.iv.2007, LT; 2 ex., 7–13.v.2007, LT; 7 ex., 20.x–10.xi.2007, LT. Wadi Bih Dam, 1



Plate 1. *Kanaarister* spec., habitus.

ex., 19.ii–1.iii.2008, LT; 4 ex., 1–6.iii.2008, LT; 6 ex., 6–17.iii.2008, LT; 1 ex., 17–25.iii.2008, LT; 3 ex., 21–30.iv.2008, LT. Wadi Safad, 68 ex., 21.ii–4.iii.2006, LT; 21 ex., 4–26.iii.2006, LT; 3 ex., 15–22.iv.2006, LT. Wadi Wurayah farm, 1 ex., 15–30.iii.2009, LT.

Subfamily **Abraeinae** MacLeay, 1819

Acritus (Acritus) copricola Cooman, 1932

Specimens examined: Fujairah, 1 ex., 8–29.v.2006, LT; 1 ex., 7.v–3.vi.2006, LT; 2 ex., 10–17.vi.2006, LT. Hatta, 1 ex., 30.i–26.ii.2006, LT; 10 ex., 16–30.viii.2006, LT; 33 ex., 14–21.vi.2008, LT. Sharjah Desert Park, 2 ex., 20.x–10.xi.2007, LT; 1 ex., 30.iv–25.v.2008, LT; 3 ex., 25.v–16.vi.2008, LT; 2 ex.,

16.vi–17.vii.2008, LT; 3 ex., 27.vii–14.viii.2008, LT; 2 ex., 9.viii–6.ix.2008, LT. Sharjah–Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT. NARC, near Sweihan, 1 ex., 1.ii–14.iii.2005, LT.

Acritus (Acritus) komai Lewis, 1879

Specimens examined: Fujairah, 3 ex., 1–8.iv.2006, LT; 6 ex., 9–29.iv.2006, LT; 8 ex., 7.v–3.vi.2006, LT; 13 ex., 8–29.v.2006, LT; 6 ex., 10–17.vi.2006, LT. Hatta, 6 ex., 30.i–26.ii.2006, LT. Hatta, 6 ex., 30.i–26.ii.2006, LT; 7 ex., 4–11.iv.2006, LT. 19 ex., 16–30.viii.2006, LT; 41 ex., 14–21.vi.2008, LT. Khor al-Khwair, 2 ex., 17–24.iv.2007, LT; 2 ex., 2–13.v.2007, LT; 1 ex., 16–23.v.2007, LT; 1 ex., 30.v–5.vi.2007, LT. Sharjah Desert Park, 1 ex., 3–10.iii.2007, LT; 1 ex., 10–17.iii.2007, LT; 17 ex., 17–24.iii.2007, LT; 10 ex., 24.iii–1.iv.2007, LT; 9 ex., 1–8.iv.2007, LT; 22 ex., 8–15.iv.2007, LT; 2 ex., 15–22.iv.2007, LT; 8 ex., 22–30.iv.2007, LT; 19 ex., 30.iv–12.v.2007, LT; 21 ex., 12–21.v.2007, LT; 7 ex., 21–28.v.2007, LT; 5 ex., 28.v–4.vi.2007; 1 ex., 4–9.vi.2007, LT; 5 ex., 20.x–10.xi.2007, LT; 2 ex., 20.x–24.xi.2007, LT; 14 ex., 14.ii–1.v.2008, LT; 16 ex., 1–5.iv.2008, LT; 8 ex., 1–30.iv.2008, LT; 1 ex., 6–30.iv.2008, LT; 4 ex., 30.iv–25.v.2008, LT; 18 ex., 25.v–16.vi.2008, LT; 3 ex., 16–23.vi.2008, LT; 12 ex., 16.vi–15.vii.2008, LT; 14 ex., 16.vi–17.vii.2008, LT; 2 ex., 15–20.vii.2008, LT; 4 ex., 27.vii–14.viii.2008, LT; 6 ex., 9.viii–6.ix.2008, LT; 6 ex., 11.xii.2008–6.i.2009, LT. Sharjah–Khor Kalba, near tunnel, 4 ex., 3–18.v.2006, LT; 7 ex., 7–14.vi.2006, LT. NARC, near Sweihan, 33 ex., 1.ii–14.iii.2005, LT. Wadi Bih Dam, 2 ex., 7–13.v.2007, LT; 2 ex., 21–30.iv.2008, LT; 2 ex., 29.vi–8.vii.2008, LT; 1 ex., 9–23.vii.2008, LT. Wadi Midaq, 3 ex., 6–13.v.2006, LT; 1 ex., 17–24.v.2006, LT. Wadi Safad, 1 ex., 15–22.iv.2006, LT. Wadi Wurayah farm, 2 ex., 22.ii–2.iii.2009, LT; 7 ex., 15–30.iii.2009, LT.

Tribe *Teretriini* Bickhardt, 1914

Teretrius (Neotepetrius) mogul Lewis, 1911

Specimens examined: Sharjah Desert Park, 2 ex., 17–24.iii.2007, LT; 1 ex., 24.iii–1.iv.2007, LT; 1 ex., 15–22.iv.2007, LT; 1 ex., 22–30.iv.2007, LT; 1 ex., 30.iv–12.v.2007, LT; 1 ex., 12–21.v.2007, LT; 1 ex., 21–28.v.2007, LT.

Teretrius (Neotepetrius) spec. 1

Specimens examined: Sharjah Desert Park, 1 ex., 21–28.v.2007, LT; 1 ex., 27.vii–14.viii.2008, LT.

Teretrius (Teretrius) pulex Fairmaire, 1877

Specimens examined: Al-Ajban, 1 ex., 2–9.iv.2006, LT. N of Ajman, 1 ex., 23–26.vi.2008, WT. Fujairah, 1 ex., 10–17.vi.2006, LT. Hatta, 1 ex., 14–21.vi.2008, LT. Sharjah Desert Park, 1 ex., 7–14.vi.2006, LT; 1 ex., 17.ii–3.iii.2007, LT; 1 ex., 10–17.iii.2007, LT; 10 ex., 17–24.iii.2007, LT; 6 ex., 24.iii–1.iv.2007, LT; 6 ex., 1–8.iv.2007, LT; 3 ex., 8–15.iv.2007, LT; 1 ex., 15–22.iv.2007, LT; 1 ex., 22–30.iv.2007, LT; 8 ex., 30.iv–12.v.2007, LT; 15 ex., 12–21.v.2007, LT; 12 ex., 21–28.v.2007, LT; 19 ex., 28.v–4.vi.2007, LT; 2 ex., 20.x–24.xi.2007, LT; 1 ex., 24.xi–22.xii.2007, LT; 3 ex., 1–6.iv.2008, LT; 13 ex., 1–30.iv.2008, LT; 1 ex., 6–30.iv.2008, LT; 25 ex., 25.v–16.vi.2008, LT; 2 ex., 16.vi–15.vii.2008, LT; 1 ex., 16.vi–17.vii.2008, LT; 7 ex., 16–23.vi.2008, LT; 27 ex., 16.vi–17.vii.2008, LT; 2 ex., 15–20.vii.2008, LT; 9 ex., 27.vii–14.viii.2008, LT; 4 ex., 9.viii–6.ix.2008, LT; 2 ex., 11.xii.2008–6.i.2009, LT. NARC, near Sweihan, 85 ex., 1.ii–14.iii.2005, LT. Wadi Safad, 1 ex., 15–22.iv.2006, LT. Wadi Wurayah farm, 1 ex., 22.ii–2.iii.2009, LT.

Subfamily *Saprininae* Blanchard, 1845

Saprinus (Saprinus) chalcites (Illiger, 1807)

Specimens examined: Sharjah Desert Park, 1 ex., 12–21.v.2007, LT; 1 ex., 21.v–4.vi.2007, LT; 1 ex., 16–23.vi.2008, LT. NARC near Sweihan, 1 ex., 30.i–26.ii.2006, LT. Um al-Quwain, 4 ex., 1–30.xi.2008, PT. Wadi Shawkah, 1 ex., 20–26.iii.2007, WT, leg. F. Menzel.



Plates 2–3. 2: *Saprinus (Saprinus) gilvicornis* Erichson; 3: *Saprinus (Saprinus) splendens* (Paykull).

Saprinus (Saprinus) confalonieri G. Müller, 1933

Specimens examined: Hatta, 2 ex., 4–11.iv.2006. LT. NARC, near Sweihan, 1 ex., 1.ii–14.iii.2005, LT; 19 ex., 30.i–26.ii.2006, LT.

Saprinus (Saprinus) gilvicornis Erichson, 1834

Plate 2

Specimens examined: Sharjah Desert Park, 1 ex., 16–22.iv.2007, LT.

Diagnosis: The length of this rather small specimen is 4.7 mm. Usually specimens are bigger.

Distribution: This species has a vast distribution in North Africa, Sudan, Chad, South Russia, Kazakhstan and Turkmenistan. Already known from Saudi Arabia and Oman. New to the UAE.

Saprinus (Saprinus) splendens (Paykull, 1811)

Plate 3

Specimens examined: Sharjah Desert Park, 1 ex., 17–24.iii.2007, LT.

Diagnosis: The length is 8.8 mm.

Distribution: This species has a vast distribution in tropical- and south Africa, the oriental region, Japan and Australia. It has already been recorded from Saudi Arabia, Yemen and Oman. New to the UAE.



Plate 4. *Pholioxenus kodymi* Olexa.

***Pholioxenus kodymi* Olexa, 1984**

Specimens examined: Sharjah Desert Park, 1 ex., 21.i–17.ii.2008, PT.

Plate 4

Diagnosis: The length is 3.25 mm.

Remarks: This species has been described from Iraq and Syria, where the specimens were collected from the burrows of small mammals. The specimen has been compared with paratypes. Contrary to what is shown in Figure 45 of Olexa's publication (1984), the prosternal striae are not widely separated. Their course is more in accordance with Figure 42. Perhaps the names in the captions have been switched.

Distribution: The species has been recorded from Iraq, Syria and Saudi Arabia. New to the UAE.

***Hypocacculus (Colpillus) praecox* (Erichson, 1834)**

Specimens examined: Fujairah, 1 ex., 21.ii–5.iii.2006, LT; 3 ex., 8–29.v.2006, LT; 12 ex., 7.v–3.vi.2006, LT. Hatta, 1 ex., 30.i–26.ii.2006, LT. Hatta, 1 ex., 30.i–26.ii.2006, LT. Sharjah Desert Park, 1 ex., 15–22.iv.2007, LT; 1 ex., 30.iv–12.v.2007, LT; 2 ex., 16–23.vi.2008, LT. NARC, near Sweihan, 1 ex., 1.ii–14.iii.2005, LT. Wadi Bih dam, 1 ex., 30.iv–4.vi.2008, LT.



Plate 5. *Exaesiopus henoni* (Schmidt).

***Hypocacculus (Nessus) ascendens desertorum* Kanaar, 2008.**

Specimens examined: Sharjah Desert Park, 1 ex., 16.vi–17.viii.2008, LT; 1 ex., 9.viii–6.ix.2008, LT; 1 ex., 1–30.xi.2008, PT; 1 ex., 1–12.ii.2009, PT. NARC, near Sweihan, 1 ex., 1.ii–14.iii.2005, LT. Wadi Bih dam, 13 ex., 22–26.iii.2009, WT; 12 ex., 2–4.iv.2009, WT; 4 ex., 5–7.iv.2009, WT.

***Alienocacculus vanharteni* Kanaar, 2008**

Specimens examined: Sharjah Desert Park, 2 ex., 17–24.iii.2007, LT; 5 ex., 24.iii–1.iv.2007, LT; 1 ex., 1–8.iv.2007, LT; 1 ex., 8–15.iv.2007, LT; 1 ex., 22–30.iv.2007, LT; 2 ex., 21–28.v.2007, LT; 1 ex., 28.v–4.vi.2007, LT; 3 ex., 14.ii–1.iv.2008; 1 ex., 11.xii–6.i.2009, LT. NARC, near Sweihan, 1 ex., 1.ii–14.iii.2005, LT.

***Exaesiopus henoni* (Schmidt, 1896)**

Specimens examined: Near Mahafiz, 1 ex., 21–28.iii.2006, LT.

Plate 5

Diagnosis: The length is 3.5 mm.

Distribution: First record for the Arabian Peninsula. This typically psammophilous species was hitherto only known from Algeria.

***Xenonychus tridens* (Jacquelin-Duval, 1852)**

Specimens examined: Near Mahafiz, 1 ex., 19–26.iv.2006, LT. Sharjah Desert Park, 1 ex., 12–21.v.2007, LT.

***Xenophilothis choumovitchi* (Thérond, 1965)**

Specimens examined: Al-Rafah, 1 ex., 1–12.ii.2009, WT. S of Ra's al-Khaimah, 2 ex., 18–22.v.2008, WT.

ACKNOWLEDGEMENTS

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Order Coleoptera, family Hydraenidae

Manfred A. Jäch and Juan A. Delgado

INTRODUCTION

Altogether, 15 species of Hydraenidae were recorded from the entire Arabian Peninsula so far. Twelve of these species occur in Saudi Arabia (*Hydraena arabica* Balfour-Browne, 1951, *Limnebius fontinalis* Balfour-Browne, 1951, *Ochthebius andraei* Breit, 1920, *O. arabicus* Jäch, 1992, *O. innexus* Balfour-Browne, 1951, *O. meridionalis* Rey, 1885, *O. micans* Balfour-Browne, 1951, *O. quadrifoveolatus* Wollaston, 1854, *O. ragusae* Kuwert, 1887, *O. thermalis* Janssens, 1965, *O. zugmayeri* Kniž, 1909, and *O. cf. viridescens* sensu Jäch & Delgado, 2008), only two are known from Oman (*Hydraena putearius* Jäch & Díaz, 2000, *H. arabica*), and six species have been found in Yemen (*Hydraena arabica*, *Limnebius arabicus* Balfour-Browne, 1951, *L. fontinalis*, *Ochthebius cameroni* Balfour-Browne, 1951, *O. innexus*, and *O. micans*) (see Jäch, 2004; Jäch & Delgado, 2008).

Surprisingly, not a single hydraenid has been recorded from the United Arab Emirates so far. Due to the efforts of J. Batelka, J.-L. Gattoliat, and especially A. van Harten more than 200 specimens of this family were collected during the years 2005–2008. These specimens represent 10 species, one of which was known from Oman, one was known from Saudi Arabia (and various other countries outside the Arabian Peninsula), one could not be identified, because only a single female was collected, while the remaining seven are new to science and described herein. Examination of additional material from neighbouring countries (Oman, Iran), deposited in the NMW and NMB, revealed, that some of the newly described species are in fact more widely distributed in the Persian Gulf Region.

The seven new species of Hydraenidae here described are: *Hydraena gattolliati* [UAE], *Limnebius pararabicus* [UAE], *L. wewalkai* [Oman, UAE], *Ochthebius harteni* [Oman, UAE], *O. monseti* [Iran, UAE], *O. patergazellae* [UAE], and *O. wurayah* [UAE]. *Hydraena putearius* Jäch & Díaz, 2000, and *Ochthebius zugmayeri* Kniž, 1909, are recorded from the UAE for the first time. One unidentified female, belonging to the *Ochthebius corrugatus* complex, is also recorded.

MATERIALS AND METHODS

The material used for this study is deposited in the following collections: Coll. Delgado, Murcia, Spain (CDM), The Natural History Museum, London, UK (NHML), Naturhistorisches Museum, Basel, Switzerland (NMB), Národní Museum v Praze, Czech Republic (NMP), Naturhistorisches Museum Wien, Austria (NMW), and United Arab Emirates Invertebrate Collection, UAE (UAEIC).

Complete lists of references and original label data will be published in a forthcoming revision of the Hydraenidae of the Arabian Peninsula (Fauna of Arabia, in prep.).

Abbreviations used in the text: PL – projected length of aedeagus (sensu Jäch, 1998); AvH – leg. A. van Harten.

SYSTEMATIC ACCOUNT

Checklist of the hydraenids of the United Arab Emirates

- Hydraena gattolliati* Jäch & Delgado, 2010 nov. spec.
Hydraena putearius Jäch & Díaz, 2000
Limnebius pararabicus Jäch & Delgado, 2010 nov. spec.
Limnebius wewalkai Jäch & Delgado, 2010 nov. spec.
Ochthebius harteni Jäch & Delgado, 2010 nov. spec.
Ochthebius monseti Jäch & Delgado, 2010 nov. spec.
Ochthebius patergazellae Jäch & Delgado, 2010 nov. spec.
Ochthebius wurayah Jäch & Delgado, 2010 nov. spec.
Ochthebius zugmayeri Kniž, 1909
Ochthebius spec. (*O. corrugatus* complex)

***Hydraena* (s. str.) *gattolliati* Jäch & Delgado nov. spec.**

Plate 1, Figures 1–8

Specimens examined: Holotype: ♂, "UNITED ARAB EMIRATES Wadi Wurayah (UAE 5808) 25.24N 56.17E 4.xii.2006 in pool and stream J.-L.Gattoliat lgt." (NMW). Paratypes: 1♂ (NMP), 1♀ (NMW), same data as holotype.

Type locality: Permanent stream in Wadi Wurayah, northeastern UAE.

Description: Habitus of male as in Plate 1; body length: 2.25–2.45 mm (males), 2.4 mm (female). Dark brown to almost black; anterior margin of labrum and all body appendages paler reddish brown; maxillary palpi unicolored.

Anterior margin of labrum deeply excised, rugosely micropunctate, mat. Clypeus more or less entirely densely punctate, matt. Middle of frons more densely punctate, more or less glabrous between punctures; lateral parts of frons (ocular groove) deeply impressed, densely micropunctate, matt. Maxillary palpi elongate and slender.

Pronotum distinctly cordiform, anterior margin concave. Surface rather densely punctate, interstices densely micropunctate, except on elevated parts of disc. Median longitudinal impression absent; oblique posterior admedian groove shallow. Sublateral groove distinct, quite deeply impressed subposteriorly.

Elytra elongate, subparallel-sided, with about 15 rows of punctures (about nine rows between suture and shoulder); rows usually very regular, except for an admedian area in anterior third; punctures small, very densely arranged; intervals narrow, very slightly convex, glabrous. Explanate margin of elytra well developed, not reaching elytral apex, anteriorly serrate; elytral apices more or less separately rounded.

Prosternum slightly impressed in front of procoxae; with prominent median keel. Mesoventrite with five distinct longitudinal ridges. Metaventral disc sexually dimorphic; metaventral plaques slender, sexually dimorphic. Intercoxal segment (= abdominal sternite II) subtrapezoidal; posterior angles strongly produced, acute.

Legs sexually dimorphic.

Male sternite X and spiculum as in Figure 4.

Aedeagus (Figs 1–3): Main piece stout, in lateral view not strongly curved, with one cluster of about 30 short or moderately long, thick acute bristles at about dorsal 0.2, these bristles are very densely set, some are hook-like. Phallobase large, distinctly asymmetrical. Distal lobe very large, complex, inserted near parameral bases, placed at left side of main piece; with conspicuous bulbous enlargement at level of apex of main piece, and with strongly sclerotized, sinuous flagellum, distinctly surpassing main piece. Parameres inserted near



Plate 1. *Hydraena* (s. str.) *gattolliati* Jäch & Delgado nov. spec., habitus, male.

phallobase, stout, almost symmetrical, with groups of conspicuous, partly modified (flattened, denticulate) setae in apical part; right paramere apically wider than left one, subtruncate; left paramere apically rounded.

Gonocoxite (Fig. 6): Transverse; apex widely rounded; inner plate laterally separated from outer plate by deep incision; proximal part exposed, asymmetrical, basal margin concave, cavea moderately large.

Spermatheca as in Figures 7–8.

Secondary sexual dimorphism: Labral margins slightly more upturned in male. Elytral apices more acuminate in female. Metaventrite of male more strongly impressed medially, metaventral plaques more or less parallel in male, slightly divergent posteriad in female. Male abdominal sternite VII with border between pubescent and glabrous area bisinuous. Male sternite X and spiculum gastrale not firmly connected with each other; sternite X small, distinctly asymmetrical, apically emarginate, cavity present. Femora of male slightly thicker than in female; protibia of male very slightly curved (straight in female); mesotibia of male very slightly curved, mesal face with small incision at about basal 0.35, slightly dilated between incision and subapical bristle; inner face of metatibia of male inconspicuously widened at posterior 0.3, with a row of short bristles between posterior 0.3 and apex.

Female tergite X (Fig. 5): transverse, subsemicircular; disc moderately densely covered with squamose setae; subapical fringe with long trichoid setae.

Differential diagnosis: Externally, the new species is not unsimilar to *H. verstraeteni* Ferro, 1984, described from southern Iran. It can be distinguished from the latter mainly by the more strongly cordiform pronotum, by the male legs (in *H. verstraeteni*, pro- and mesotibiae not curved, mesotibia with distinct swelling, inner face of metatibia of male more significantly expanded at posterior 0.4) and by the male genitalia (see Ferro, 1984: Fig. 7).

Distribution: So far known only from the type locality.

Etymology: Named in honour of Dr. Jean-Luc Gattoliat (Musée cantonal de zoologie, Lausanne, Switzerland), who collected the type material.

Hydraena (s. str.) putearius Jäch & Díaz, 2000

Plate 2

Specimens examined (localities sequenced alphabetically): UAE: Bithnah, 6 ex. (NMP, NMW, UAEIC), 2.ii–2.iii.2006, light trap, AvH. Hatta, 1 ex. (NMP), 4–11.iv.2006; 8 ex. (NMP, NMW, UAEIC), 8–26.iv.2006; 1♂ (NMW), 24–30.v.2006, all light trap, AvH. Near Mahafiz, 1 ex. (NMW), 2.ii–2.iii.2006, light trap, AvH. Wadi Maidaq, 2 ex. (NMP, UAEIC), 27.xi–21.xii.2005; 1 ex., 27.iv–4.v.2006; 2 ex. (NMP, NMW), 17–24.v.2006; 1 ex. (NMW), 1–8.vii.2006; all light trap, AvH; in pool, 4 ex. (NMP, NMW, UAEIC), 28.xi.2006, leg. J.-L. Gattoliat. Wadi Safad, 2 ex. (NMW), 21.ii–4.iii.2006, light trap, AvH. Wadi Wurayah, stream and pool, 1 ex. (NMW), 26.xi.2006, leg. J.-L. Gattoliat; 2 ex. (NMW), 4.xii.2006, leg. J.-L. Gattoliat. Wadi Wurayah farm, 1 ex. (NMP), 12–19.iv.2008, light trap, AvH.

Diagnosis: Habitus as in Plate 2. The aedeagus was illustrated by Jäch & Díaz (2000: Fig. 9).

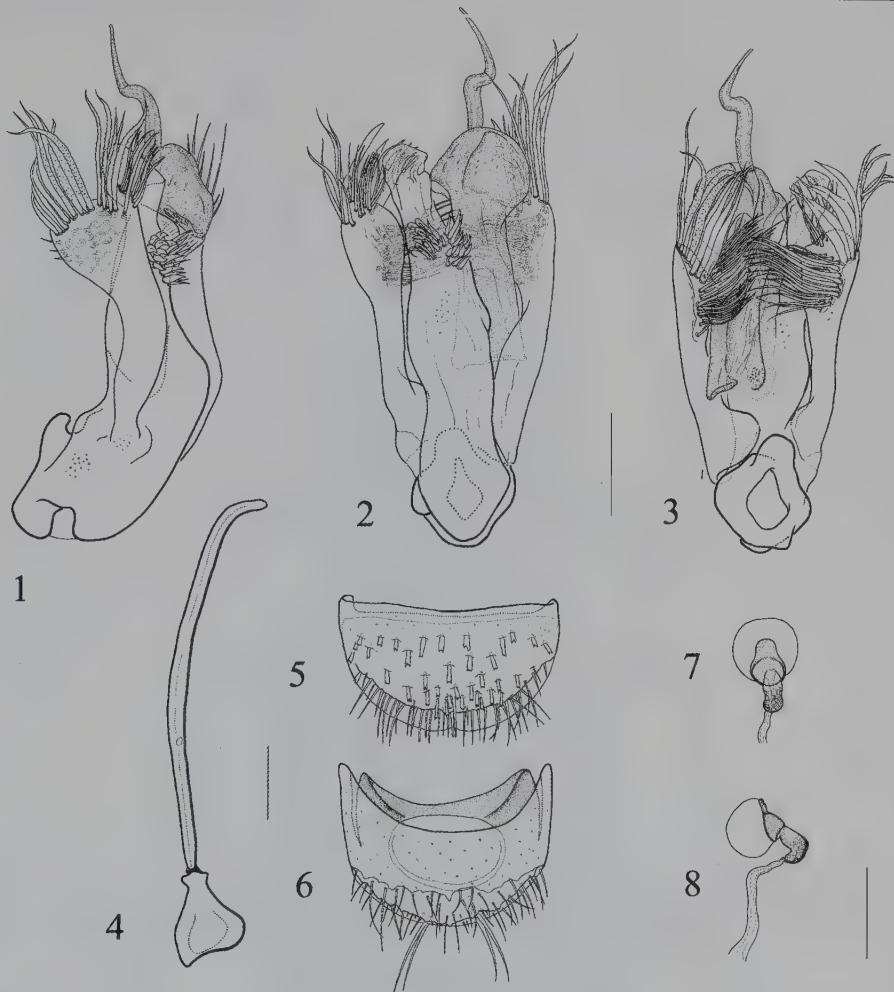
Distribution: This species was so far known only from Oman. It is here recorded from the UAE for the first time.

Limnebius pararabicus Jäch & Delgado nov. spec.

Plate 3, Figures 11–16

Specimens examined: Holotype: ♂, “UNITED ARAB EMIRATES Wadi Shawkah 1–7.iv.2007 25.06N 58.03E [coordinates incorrect, 25°06'N 56°02'E] (UAE 7949) A. van Harten lgt.” (NMW). Paratypes: 1♂, 1♀, same data as holotype (NMW); 2 ex., same locality but 5–12.v.2007, water traps, AvH (NMP, UAEIC). 1♀, Hatta, 8–26.iv.2006, light trap, AvH (NMW).

Type locality: Wadi Shawkah, UAE, permanent stream in mountainous area.



Figures 1–8. *Hydraena gattoliati* nov. spec. 1–3: Aedeagus. 1: Lateral view; 2: Dorsal view; 3: Ventral view. 4: Male sternite X and spiculum gastrale; 5: Female tergite X; 6: Gonocoxite; 7–8: Spermatheca. Scales: 0.1 mm (upper scale: 1, 2, 3; lower left scale: 4, 5, 6, lower right scale: 7, 8).

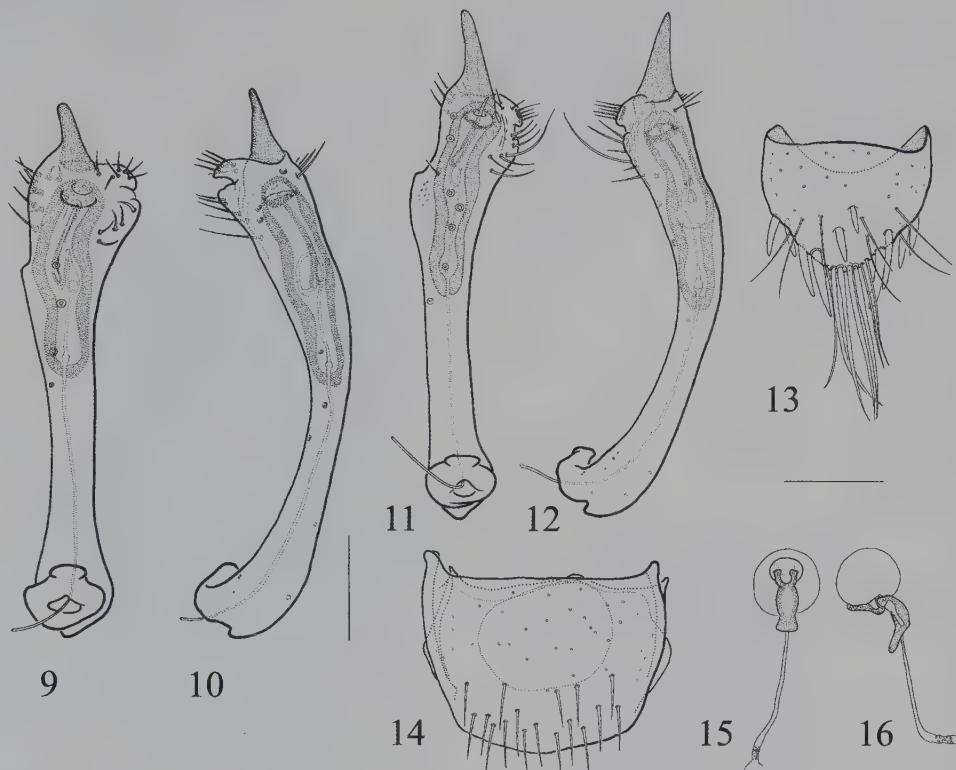
Diagnosis: Habitus as in Plate 3. *Limnebius pararabicus* is a member of the *L. atomus* species group (sensu Jäch, 1993). It is very similar and very closely related to *L. arabicus* Balfour-Browne, 1951, known from Yemen and Israel.

Externally, it agrees with the latter in general appearance incl. body length of 0.80–1.05 mm. Surface of pronotum smooth and glabrous, very sparsely and superficially micropunctate. Elytral margins gently rounded, less parallel than in *L. myrmidon* Rey, 1883. Elytral surface smooth anteriorly, more or less superficially shagreened posteriorly.

Aedeagus (Figs 11–12): Length and curvature of main piece more or less as in *L. arabicus* (Figs. 9–10). It differs from the latter in a few subtle, but significant characters, e.g. the



Plate 2. *Hydraena* (s. str.) *putearius* Jäch & Díaz, habitus.



Figures 9–16. 9–10: *Limnebius arabicus* Balfour-Browne, aedeagus. 9: Ventral view; 10: Lateral view. 11–16: *Limnebius pararabicus* nov. spec. 11: Aedeagus in ventral view; 12: Aedeagus in lateral view; 13: Female tergite X; 14: Gonocoxite; 15–16: Spermatheca. Scales: 0.05 mm (left scale: 9, 10; right scale: 11–16).

distribution of the subapical setae; apex less strongly widened than in *L. arabicus* (ventral view); in dorso-lateral view right apical corner less produced, less beak-like; ejaculatory duct very slightly projecting apically. Distal lobe slightly larger (longer and wider) than in *L. arabicus*.

Gonocoxite (Fig. 14) subtrapezoidal, slightly wider than long, apically slightly arcuate; disc moderately densely setose in apical half; inner plate very slightly projecting basally and laterally; cavea large. Tergite X (Fig. 13) small, subtriangular; basal margin gently convex; apical half sparsely covered with thick bristles; apex with two pairs of very long setae. Spermatheca as in Figures 15–16.

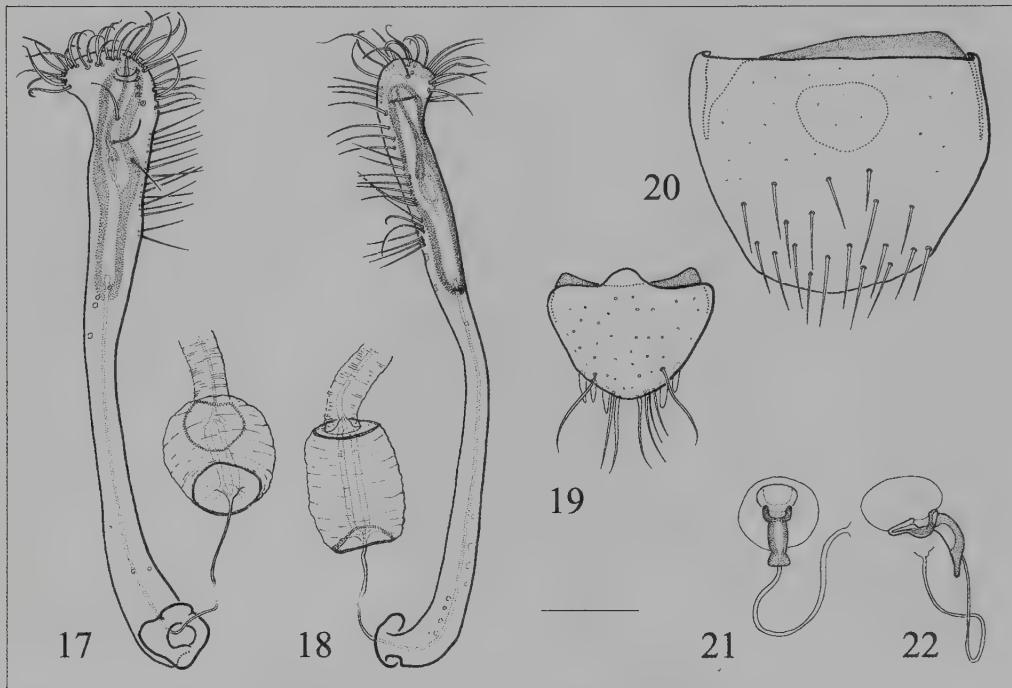
Distribution: So far only known from the UAE.

Etymology: Named in reference to its sister species, *Limnebius arabicus*.

***Limnebius wewalkai* Jäch & Delgado nov. spec.**

Plate 4, Figures 17–22

Specimens examined: Holotype: ♂: "UNITED ARAB EMIRATES Wadi Safad, 25.13N 56.19E 21.ii.-4.iii.2006; light trap A. van Harten lgt. (UAE7514)" (NMW). Maxillary palpi lacking. Paratypes: 1♀,



Figures 17–22. *Limnebius wewalkai* nov. spec. 17: Aedeagus and sperm pump in ventral view; 18: Same, in lateral view; 19: Female tergite X; 20: Gonocoxite; 21–22: Spermatheca. Scale: 0.05 mm.

same data as holotype (NMW); 1 ex., same locality but 4–26.iii.2006, light trap, AvH (NMP). 1 ex., 15–22.iv.2006, light trap, AvH (NMW). 1 ex., Bithnah, 4–26.iii.2006, light trap, AvH (NMW). 1♂, Sharjah-Khor Kalba, near tunnel, 26.iv–3.v.2006, light trap, AvH (NMW). 1♂, Wadi Maidaq, 17–24.v.2006, light trap AvH (NMW). 1♀, Wadi Shawkah, 1–7.iv.2007, water traps, AvH (NMW); 14 ex., 31.viii–11.ix.2008, water traps, AvH (NHML, NMP, NMW, UAEIC). OMAN: 11 ex., 19.ii.1998, 50 km E of Badiya, Wadi Bani Kalil, leg. G. Wewalka (NHML, NMW).

Additional specimens examined: OMAN: 2 ex., Wadi Andam, 650 m, 20 km N of Samad, 22°58'N 58°05'E, 17–18.iv.1985, leg. C. Holzschuh ("*Limnebius arabicus* Br. HEBAUER det.") (NMB). Both specimens lack the abdomen. According to external characters, they obviously represent male and female of *L. wewalkai*.

Type locality: Wadi Safad, northeastern UAE. The light trap was placed in a farm near a small permanent stream in a mountainous area.

Diagnosis: Habitus as in Plate 4. *Limnebius wewalkai* is also a member of the *L. atomus* species group (sensu Jäch, 1993). Its body (0.90–1.10 mm) is on average slightly longer than that of *L. pararabicus*, from which it can be distinguished by the following features: coloration often paler brown; body form more parallel-sided, less drop-shaped; elytra apically less declivitous; pronotum microreticulate (antero-)laterally; elytral surface superficially shagreened, even anteriorly.

Secondary sexual dimorphism: Tibiae, especially protibiae of male slightly wider than in female. Elytral apex of male subtruncate, very slightly produced in female.

Aedeagus (Figs 17–18): Main piece very long and slender, almost straight, very gently curved; apex slightly asymmetrically widened, with numerous moderately long setae in apical



Plates 3–4. 3: *Limnebius pararabicus* Jäch & Delgado nov. spec., habitus; 4: *Limnebius wewalkai* Jäch & Delgado nov. spec., habitus.

third; ejaculatory duct very slightly projecting apically. Sperm pump (Fig. 17–18) well developed.

Gonocoxite (Fig. 20) subtrapezoidal, sometimes distinctly asymmetrical, wider than long, apically arcuate; disc moderately densely or sparsely setose in apical half; inner plate asymmetrically projecting basally; cavea small or moderately large. Tergite X (Fig. 19) small, subtriangular; basal margin with conspicuous projection near middle; apical margin with few (at least two) thick bristles and several trichoid setae. Spermatheca as in Figures 21–22.

Distribution: UAE, Oman.

Etymology: Named after Prof. Dr. Günther Wewalka, who collected this species in Oman more than ten years ago.

***Ochthebius* (s. str.) *harteni* Jäch & Delgado nov. spec.**

Plate 5, Figures 23–26

Specimens examined: Holotype: ♂, “UNITED ARAB EMIRATES Hatta 24.49N 56.07E 24-30.v.2006 in light-traps A. van Harten lgt.(UAE4372)” (NMW). Paratypes: 1♂, same locality but 8–26.iv.2006, light trap, AvH (NMP). 1 ex., Bithnah, 2.ii–2.iii.2006, light trap, AvH (NMP). 1♀, National Avian Research Centre, near Sweihan, light trap; AvH (NMW). OMAN: 1♂, Wadi Andam, 650 m, 20 km N of Samad 22°58'N/58°05'E, 17–18.iv.1985, leg. C. Holzschuh (NMB).

Type locality: Hatta, Hajar Mountains, northeastern UAE. Original habitat of the holotype not known.

Diagnosis: Habitus as in Plate 5. Body length (abdomen not included) 1.55–1.70 mm. *Ochthebius harteni* is characterised by rather strongly impressed pronotal foveae, and densely punctate elytra. Externally, it can be hardly distinguished from *O. innexus*. It differs from *O. pakistanicus* Jäch & Delgado, 2009 (which has similarly deeply impressed pronotal foveae) in the more convex pronotum and in the more densely punctate elytra. *Ochthebius pallidulus* Kuwert, 1887, another superficially similar species from the Middle East, differs, among several other characters, in the significantly elongate labrum.

Aedeagus (Figs 23–26): PL of main piece of holotype ca. 0.34 mm. Main piece rather evenly curved (lateral and ventral view); with a flat, moderately large, rounded subapical projection on left side. Distal lobe with a right branch (globular, forming a well sclerotized ring), and with a well developed left branch, which is elongate and slender in lateral and dorsal view, in lateral view it is slightly curved ventrad.

The distal lobe of the new species somewhat resembles that of the *O. mediterraneus* complex (see Jäch & Delgado, 2009), but in *O. harteni* the main piece is more distinctly curved and the projection (Fig. 26) is subapical instead of apical. The aedeagus of *O. innexus* (see Jäch, 1991: Fig. 21) is distinguished readily by the long distal lobe.

Variability: In specimens from the UAE the pronotum is more densely punctate than in the single specimen from Oman.

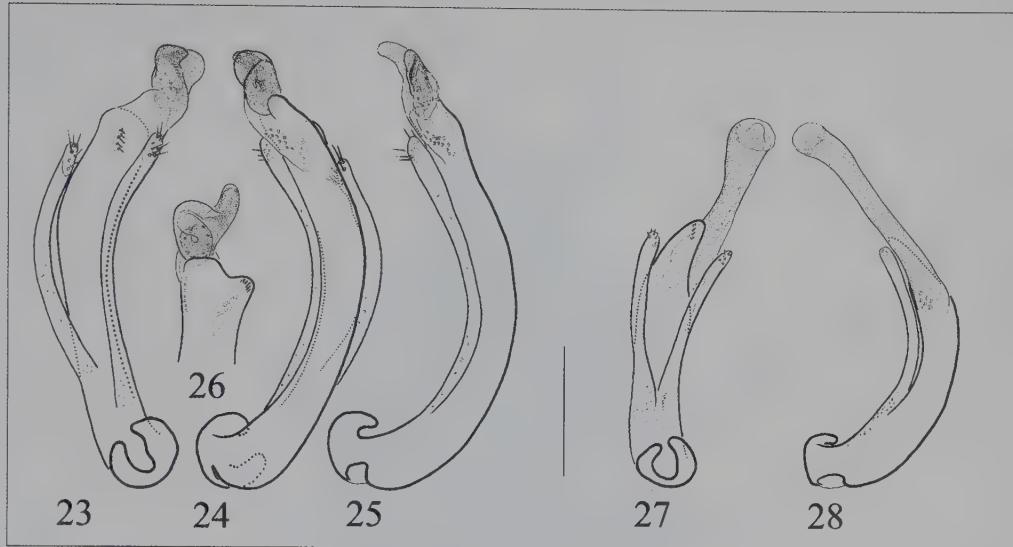
Distribution: UAE, Oman.

Etymology: Named in honour of Antonius van Harten, who collected most of the type specimens.

***Ochthebius* (s. str.) *monseti* Jäch & Delgado nov. spec.**

Plate 6, Figures 27–28

Specimens examined: Holotype: ♂, “UNITED ARAB EMIRATES Wadi Maidaq 25.18N 56.07E, light trap 1-8.vii.2006 (UAE 5547) A. van Harten lgt.” (NMW). Paratypes: 1♀, Hatta, 8–26.iv.2006, light trap, AvH (NMW); 1 ex., 17–24.v.2006 Hatta, light trap, AvH (NMP). 3 ex., Sharjah-Khor Kalba, near tunnel, 26.iv–3.v.2006, light trap, AvH (NMP, NMW); 2♀, 24–30.v.2006, light trap, AvH (NMP, UAEIC). SE IRAN: 1♂, “Sistan & Baluchestān Zāhedān, 40 Km. S. Khāsh, Sangān village, 1639m., 3.XI.2004, N 38°34'38.9"E 61°19'22.6"[N] Mogh./Hāj./Nās.” (NMW).



Figures 23–28. 23–26: *Ochthebius harteni* nov. spec., aedeagus. 23: Ventral view; 24: Dorso-lateral view; 25: Lateral view; 26: Apex in dorsal view to show maximum outlines. 27–28: *Ochthebius monseti* nov. spec., aedeagus. 27: Ventral view; 28: Lateral view. Scale: 0.1 mm.

Type locality: Wadi Maidaq, northeastern UAE. The light trap was placed on a farm near a very small permanent stream in a mountainous area.

Diagnosis: Habitus as in Plate 6. Body length: 1.50–1.65 mm. Externally, *Ochthebius monseti* is not unsimilar to *O. micans* Balfour-Browne, 1951, known from Israel, Jordan, Saudi Arabia, and Yemen. It differs from the latter mainly in the lateral margin of the pronotum, which is more widely rounded instead of angulate; in addition, the posterior admedian pronotal foveae are on average more slender; the elytral striae are obviously somewhat variable in both species: in the specimens from the UAE they are rather distinctly punctate (more or less regular), while in the single specimen from Iran, the elytral punctation is rather superficial (all striae straight); the aedeagus of *O. micans* differs significantly in the considerably shorter distal lobe (see Jäch 1992b: Fig. 7). *Ochthebius difficilis* Mulsant, 1844, is another related species, which is wide-spread in West Palaearctic Region, incl. the Middle East (Turkey, Iran, Israel, Lebanon, Syria); externally, it differs from the new species in the pronotal foveae and elytral punctures, which are very superficially impressed; the distal lobe of *O. difficilis* is distinctly spatulate (Jäch 1992b: Fig. 8). *Ochthebius montesi* Ferro, 1984, from Spain shares an almost identical aedeagus with *O. monseti*; externally, these two species are distinguished by the lateral margin of the pronotum being more angulate in *O. montesi*, and by the posterior admedian pronotal foveae being distinctly smaller in the latter. In addition, the distal lobe seems to be hardly noticeably thinner and longer in *O. monseti*.

Aedeagus (Figs 27–28): Almost identical with *O. montesi* (see Jäch, 1992b: Fig. 4) with which it shares size and overall general appearance, incl. the shape of the main piece and the unusually long distal lobe. The aedeagus of the new species can be distinguished from the latter mainly in the position of the parameres, which are more contiguous with the main piece (more distant in *O. montesi*).

Distribution: Southeastern Iran, UAE.



Plate 5. *Ochthebius* (s. str.) *harteni* Jäch & Delgado nov. spec., habitus.



Plate 6. *Ochthebius* (s. str.) *monseti* Jäch & Delgado nov. spec., habitus.

Etymology: The epithet ‘monseti’ is an anagram of ‘montesi’, referring to the remarkable aedeagal similarity between *Ochthebius montesi* and *O. monseti*.

***Ochthebius* (s. str.) *patergazellae* Jäch & Delgado nov. spec.**

Plate 7, Figures 29–30

Specimens examined: Holotype: ♂, “UNITED ARAB EMIRATES Al-Ajban 24.36N 55.01E 5-12.vi.2006; in light-traps A. van Harten lgt.(UAE4268)” (NMW).

Type locality: Al-Ajban, UAE. The light trap was placed on a forested property with an artificial lake. It is, however, uncertain whether this artificial lake is indeed the original habitat of *Ochthebius patergazellae*.

Diagnosis: Habitus as in Plate 7. Body length 1.4 mm. *Ochthebius patergazellae* is a very gracile and slender species, obviously a member of the *Ochthebius andraei* species group (sensu Jäch, 1992a). Dorsum dark-brown to black, legs and maxillary palpi yellowish to brown, apical segment of maxillary palpi darkened in apical half. Labrum elongate and distinctly excised anteriorly, not upturned. Surface of head superficially microreticulate. Pronotum slightly wider than long, weakly heart-shaped; surface more or less entirely microreticulate/micropunctate, all foveae more or less obsolete; median and lateral grooves very shallow; hyaline border well developed, especially anteriorly. Elytra elongately oval, rugosely punctate, with five rows of punctures between suture and shoulder, intervals hardly noticeably convex, not glabrous; explanate margin narrow; epipleura entirely pubescent. Middle of metaventrite glabrous. Meso- and metatibiae with a few longer hairs, but without fringes of long ‘swimming hairs’. Sixth ventrite entirely mat.

Aedeagus (Figs 29–30): Main piece moderately long, slender, gently curved. Distal lobe elongate, subcylindrical. Parameres long and slender, more or less symmetrical, almost reaching apex of main piece.

Differential diagnosis: *Ochthebius patergazellae* vaguely resembles *O. zugmayeri* (Plate 9) in the general body shape and the obsolete pronotal foveae. It differs from the latter in the distinctly smaller size, absence of a distinct pronotal projection, absence of tibial ‘swimming hairs’, and several other characters, including the shape of the aedeagus (Jäch, 1992a: Fig. 10). *Ochthebius andraei* Breit, 1920, known from Saudi Arabia differs in the larger size, presence of distinct pronotal foveae, less strongly excised labrum, more distinctly punctate elytra and the shape of the aedeagus (Jäch, 1992a: Fig. 3). *Ochthebius cupricollis* Sahlberg, 1903, from Turkmenistan is not unsimilar in the obsolete pronotal foveae and the rugose elytral punctuation, but differs in the conspicuously cupreous head and pronotum, brownish elytra, larger size and in the shape of the aedeagus (Jäch, 2002: Fig. 1).

Distribution: So far known only from the type locality.

Etymology: The type locality of *Ochthebius patergazellae* is located about 40 km northeast of Abu Dhabi city. Abu Dhabi (أبوظبي), literally: father of gazelle; Latin: pater gazellae) is the Capital City and second most populous city in the UAE.

***Ochthebius* (s. str.) *wurayah* Jäch & Delgado nov. spec.**

Plate 8, Figures 31–32

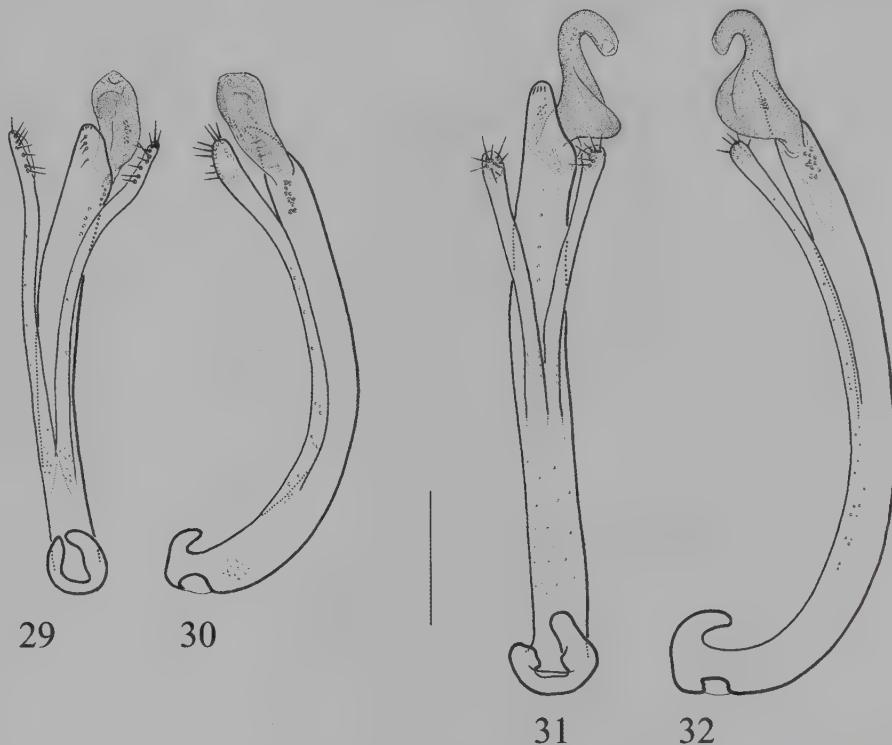
Specimens examined: Holotype: ♂, “UNITED ARAB EMIRATES Wadi Maidaq 25.18N 56.07E 2-16.ii.2006 in light-traps A. van Harten lgt. (UAE 4996)” (NMW). Paratypes: 132 ex. (CDM, NHML, NMB, NMP, NMW, UAEIC), Wadi Wurayah, 210 m, 25.iii.2007, leg. J. Batelka.

Type locality: Wadi Maidaq, northeastern UAE. The light trap was placed on a farm near a very small permanent stream in a mountainous area.

Diagnosis: Habitus as in Plate 8. Body length 1.7–2.1 mm. Externally, this species agrees very well with *O. khuzestanicus* Ferro, 1982, described from southwestern Iran. Both species



Plate 7. *Ochthebius* (s.str.) *patergazellae* Jäch & Delgado nov. spec., habitus, male.



Figures 29–32. 29–30: *Ochthebius patergazellae* nov. spec., aedeagus. 29: Ventral view; 30: Lateral view. 31–32: *Ochthebius wurayah* nov. spec., aedeagus. 29: Ventral view; 30: Lateral view. Scale: 0.1 mm.

are characterized by very densely punctate elytra with tuberculate intervals; pronotal disc usually very densely punctate, only occasionally with glabrous interstices between punctures. Aedeagus (Figs 31–32): General appearance (e.g. curvature of main piece) as in *O. khuzestanicus* (see Jäch, 1999: Fig. 20). It differs significantly from the latter in the longer distal lobe (ca. 430–440 µm in *O. wurayah*, ca. 360 µm in *O. khuzestanicus*) and in the tube-like process of the distal lobe being shorter and more strongly curved.

Distribution: So far only known from two localities in the UAE.

Etymology: Fujairah (الفجيرة) is one of the seven Emirates that make up the United Arab Emirates. It is located in the northeast of the UAE, at the shores of the Gulf of Oman. Fujairah is the only Emirate of the UAE that is almost totally mountainous. Therefore, Fujairah boasts a higher than average yearly rainfall, which allows for more varied water beetle habitats, including streams and water falls. Wadi Wurayah, from where three species of Hydraenidae (*H. gattollati*, *H. putearius*, and *O. wurayah*) have been collected, is the most important area for nature conservation in Fujairah and probably in the entire UAE. Since April 2009 Wadi Wurayah has been a fully protected area.



Plate 8. *Ochthebius* (s. str.) *wurayah* Jäch & Delgado nov. spec., habitus.

***Ochthebius* (s. str.) *zugmayeri* Kniž**

Plate 9

Specimens examined: UAE, al-Ajban, 1♂ (NMW), 25.ii–27.iii.2006, light trap, AvH.

Diagnosis: Habitus as in Plate 9. This species is a member of the *Ochthebius notabilis* group (sensu Jäch, 1992a). It is characterized by the very long, deeply excised labrum, by the pronotal foveae and elytral punctures at least partly obsolete, by the acute anterior corners of the pronotum and by the long ‘swimming hairs’ on the tibiae. Females are easily distinguished from males by the more strongly projecting anterior pronotal corners and by the medially widely explanate elytral gutter.

Aedeagus as in Jäch (1992a: Fig. 10). PL ca. 400–470 µm.

Remarks: Specimens from the Arabian Peninsula are on average darker than those from Iran and Turkmenistan. Molecular analyses will be necessary to evaluate the taxonomic status of the populations from Saudi Arabia and the UAE.

Distribution: This species was recorded so far from Iran, Turkmenistan, Kuwait, and Saudi Arabia. It is here recorded from the UAE for the first time.

***Ochthebius* (s. str.) spec.**

Plate 10

Specimens examined: UAE, Khor al-Khwair, 1♀ (NMW), 16–23.v.2007, light trap, AvH.

Remarks: Collections were made with light trap in a small date farm in the coastal area, between a mountain ridge and the sea. Therefore exact habitat unknown.

This single female obviously represents an undescribed species, closely related with *Ochthebius corrugatus* Rosenhauer, 1856. Some unidentified specimens from Pakistan (deposited in the NMW) might well belong to the same species.

This species is easily recognized by its tricoloured dorsum (frons black, pronotal margins and elytra yellowish, remainder brown).

Key to adult Hydraenidae of the United Arab Emirates

- 1 Last segment of maxillary palpi peg-like, thinner than penultimate one. (Plates 5–10).

Ochthebius 4
- Last segment of maxillary palpi not peg-like, not thinner than penultimate one. (Plates 1–4) 2
- 2 Body outlines continuous, without evident angle between pronotum and elytra (habitus more or less drop-shaped); maxillary palpi not exceedingly long, last segment not distinctly longer than penultimate one; pronotum broadest at base; elytra not distinctly punctate. Body length (abdomen excluded) 0.8–1.1 mm. (Plates 3–4) *Limnebius pararabicus* nov.spec.

..... *Limnebius wewalkai* nov. spec.

Identification of these two species should preferably be based on examination of the aedeagus or the female pygidial sclerites (Figs 11–16). In *L. wewalkai* the elytra are entirely shagreened, in *L. pararabicus* only posteriorly.
- Body outlines not continuous, with distinct angle between pronotum and elytra; maxillary palpi exceedingly long, last segment almost twice as long as penultimate one; pronotum broadest near middle, basally attenuate; elytra always distinctly punctate. Habitus (Plates 1–2). Body length (abdomen excluded) 1.60–2.45 mm. ***Hydraena*** 3
- 3 Body (abdomen excluded) shorter: 1.60–1.80 mm. Coloration of dorsal side more or less brown to dark brown. Elytra with seven rows of punctures between suture and shoulder. (Plate 2) ***Hydraena putearius*** Jäch & Díaz



Plate 9. *Ochthebius* (s. str.) *zugmayeri* Kniž, habitus, male.



Plate 10. *Ochthebius* (s.str.) spec., habitus.

- Body (abdomen excluded) longer: 2.25–2.45 mm. Coloration of dorsal side more or less black. Elytra with about nine rows of punctures between suture and shoulder. (Plate 1) *Hydraena gattoliati* nov. spec.
- 4** Labrum very long, distinctly longer than clypeus. Anterior corners of pronotum forming acute spine-like process. Tibiae with long ‘swimming hairs’. Body length (abdomen excluded) 1.9–2.3 mm. (Plate 9) *Ochthebius zugmayeri* Kniž
- Labrum about as long as clypeus, rarely very slightly longer. Anterior corners of pronotum rounded, rectangular or slightly acute, never extended into distinct process. Tibiae without long ‘swimming hairs’. Body length (abdomen excluded) 1.4–2.1 mm
- **5**
- 5** Head very elongate, approximately as long as wide (length measured from tip of labrum to posterior margin of eyes). Pronotal foveae very shallow, almost obsolete. Body length (abdomen excluded): 1.4 mm. (Plate 7) *Ochthebius patergazellae* nov. spec.
- Head distinctly wider than long (length measured from tip of labrum to posterior margin of eyes). Pronotal foveae well impressed. Body length (abdomen excluded): 1.5–2.1 mm
- **6**
- 6** Anterior margin of pronotum distinctly emarginate sublaterally, thus anterior corners acute. Elytra very densely punctate, interstices rugosely tuberculate. Body length (abdomen excluded) 1.7–2.1 mm. (Plate 8) *Ochthebius wurayah* nov. spec.
- Anterior margin of pronotum not emarginate sublaterally, thus anterior corners rectangular or rounded. Elytra not very densely punctate, interstices rather smooth. Body length (abdomen excluded) 1.5–1.7 mm
- **7**
- 7** Colouration of dorsum black. Body length (abdomen excluded) 1.50–1.65 mm. (Plate 6)
- *Ochthebius monseti* nov. spec.
- Colouration of dorsum not entirely black, at least elytra brownish or yellowish (Plates 5, 10). Body length (abdomen excluded) 1.55–1.80 mm.
- **8**
- 8** Labrum distinctly emarginate anteriorly. Body length (abdomen excluded) 1.55–1.70 mm. (Plate 5) *Ochthebius harteni*
- Labrum not emarginate anteriorly. Body length (abdomen excluded) 1.8 mm (Plate 10)..
- *Ochthebius* spec. (cf. *corrugatus*)

DISCUSSION

Eight of the 10 species collected in the UAE are new to science! Seven of these new species are described herein, the eighth one is not described because only a single female has been collected so far.

The hydraenid fauna of the UAE shows rather close faunistic relationships with Oman (three of the nine identified UAE species occur also in Oman, two of them occur also in Iran and one occurs in Saudi Arabia). Four species are so far known only from the UAE: *Hydraena gattoliati*, *Limnebius pararabicus*, *Ochthebius patergazellae*, and *O. wurayah*, but one can expect, that at least some of these species are more widely distributed, probably occurring also in Oman.

Generally, hydraenids are rarely found at light. Most surprisingly, according to label data nine of the ten species recorded from the UAE were collected at light! Some of the species were collected at light only, and therefore their original habitat remains unknown (e.g. *Ochthebius patergazellae*, *O. cf. corrugatus*).

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Coleoptera, family Leiodidae

Zdeněk Švec

INTRODUCTION

The family Leiodidae commonly also called ‘Round fungus beetles’, ‘Small carrion beetles’, ‘Small scavenger beetles’ or ‘Mammal-nest beetles’ is widespread all over the world; it is represented by approximately 280 genera with more than 1350 species in the Palaearctic (Perreau, 2004). The family had not been known to occur in the United Arab Emirates. All five species presented in this paper are new for the UAE; one of them is recorded for Tunisia for the first time; four of them are also new to science.

The biology of the members of the family is partly known. As a rule they inhabit leaf litter or other rotten plant or animal remains permeated and being decomposed by fungi and/or bacteria; other species are found in the mycelium or in fruiting bodies of fungi or of slime mould. Some inquiline genera live in the nests of Meliponinae bees, termites, mammals and birds. The relationships between mycophilous beetles and fungi can also be complicated by inquilism (Newton, 1998). The species associated with fungi usually occur under specific conditions determined by the origin, age and biodiversity of the forest vegetation, temperature, humidity etc. that are important for the growing fungi, therefore at least some of the mycophilous beetles could be considered as an indicator of habitat quality. So the findings of the representative of the four mycophilous genera of the family in the UAE seem to be an interesting contribution to the knowledge of the distribution of the family.

MATERIALS AND METHODS

The paper is based on material from the UAE recently collected by A. van Harten. The specimens dealt with are divided between the United Arab Emirates Invertebrate Collection (UAEIC) and the author’s collection (ZSPC); all holotypes are in the ZSPC.

The male genitalia have been removed from the specimens, dissected in a drop of water, rinsed and later mounted in Gum Arabic.

The measurements of total body length were taken from all specimens examined. Specific measurements of the individual body parts were taken from the holotypes only. They were measured to the first decimal place of millimetre. The descriptions are based on the holotypes. Variability is mentioned in the paragraph ‘Variation’ and includes features exhibited by females and other type material.

Classification of the types of the mesosternal carina in the description of *Leiodes antoniusi* nov. spec. follows Švec (2008).

Abbreviations used in the paper: UAE = United Arab Emirates; UAEIC = United Arab Emirates Invertebrate Collection; ZSPC = Collection of Zdeněk Švec, Prague; LT = light trap; MT = Malaise trap; PT = pitfall trap; WT = water trap; NARC = National Avian Research Centre.

SYSTEMATIC ACCOUNT

Hydnobius vanharteni Švec nov. spec.

Plate 1, Figure 1

Specimens examined: Holotype: ♂, United Arab Emirates, Sharjah Desert Park, 25°17'N 55°42'E, 21.xii.2006–23.i.2007, in light trap, leg. A. van Harten. Paratypes: 10♂, 14♀, same data; 2♀, same locality but 11.xii.2005–18.i.2006, LT; 7♂, 5♀, 2–30.i.2006, LT; 1♂, 2♀, 25.ii–25.iii.2006, LT; 1♂, 6–

28.xii.2006, PT; 2♂, 3♀, 17.ii–3.iii.2007, LT; 1♂, 2♀, 3–10.iii.2007, LT; 2♂, 1♀, 24.iii–1.iv.2007, LT; 1♂, 20.x–24.xi.2007, LT; 8♂, 9♀, 24.xi–22.xii.2007, LT; 3♂, 5♀, 14.ii–1.iv.2008, LT; 1♂, 1♀, 1–6.iv.2008, LT; 5♂, 2♀, 9.viii–6.ix.2008, LT; 8♂, 9♀, 15.xii.2008–12.i.2009, LT; 2♂, 3♀, 12.i–2.ii.2009, LT; 9♂, 8♀, 31.i–12.ii.2009, LT. 1♀, al-Ajban, 28.xii.2005–29.i.2006, MT & LT. 1♂, 2♀, Bithnah, 31.xii.2005–2.ii.2006, LT; 1♀, 2.ii–2.iii.2006, LT; 1♂, 3♀, 4–26.iii.2006, LT. 9♂, 13♀, Hatta, 30.i–26.ii.2006, LT; 1♂, 7♀, 19–28.iii.2006, LT; 2♂, 4♀, 4–11.iv.2006, LT. 1♀, Khor al-Khwair, 1–8.iii.2007, LT; 2♀, 8–14.iii.2007, LT; 2♀, 15–22.iii.2007, LT, 3♂, 7♀, 22–29.iii.2007, LT. 1♂, near Mahafiz, 2.ii–2.iii.2006, LT; 3♀, 21–28.iii.2006, LT. 1♂, Sharjah-Khor Kalba, near tunnel, 16–31.i.2006, LT; 7♂, 3♀, 1–21.02.2006, LT; 1♀, 7–22.iii.2006, LT. 1♂, 2♀, Wadi Bih dam, 1–15.iii.2007, LT; 1♀, 17–25.iii.2008, LT; 1♂, 1♀, 25.ii–8.iii.2009, MT. 12♂, 10♀, Wadi Safad, 26.iv–4.v.2006, LT. 1♀, Wadi Wurayah farm, 15.i–22.ii.2009, LT.

Description: Oblong oval, length 1.7–3.1 mm, in holotype 2.4 mm, head 0.3 mm, pronotum 0.7 mm, elytra 1.4 mm, antenna 0.6 mm, maximum width of head 0.7 mm, pronotum 1.1 mm just before base, elytra 1.2 mm between anterior fourth and half of their length.

Red-yellowish including legs and entire antennae, with basal margin of pronotum darker; venter red-yellow, coxal margins and trochanters darkened.

No microsculpture but puncturation presents on dorsum.

Head. Distinctly densely punctured, punctures separated by about 1–2 times their own diameter; confluent in some places. Two pairs of large punctures present on vertex. Ratios of length of antennomeres 2–11 (2nd antennomere equal to 1.0): 1.0–1.2–0.7–0.7–0.7–1.5–0.5–1.7–1.7–2.0. Ratios of width of antennomeres 2–11 (2nd antennomere equal to 1.0): 1.0–0.8–0.8–1.2–1.3–2.2–1.5–2.7–2.8–2.3. Ratios width: length of club antennomeres: 1.4–3.0–1.6–1.7–1.2.

Pronotum. Hind angles blunt, very widely rounded, therefore angles almost indistinct in dorsal view; rounded laterally seen. Base straight. Punctured; punctures distinct, strong, separated by about 1–2 times their own diameter, sparsely distributed in some places. Few punctures bear semierected setae.

Scutellum. With several punctures smaller than those on pronotum.

Elytra. Punctured, punctures arranged in irregular rows, feebly expressed on anterior third of elytra. Rows of punctures quite regular on caudal two thirds of elytral surface. Punctures strong, separated by about their own diameter. Elytral intervals with punctures of the same size and intensity as those in primary rows; arranged in rows similarly as punctures in primary rows. A few punctures bear semierect short setae oriented caudally. Sutural stria developed terminating approximately at the anterior third of elytral length.

Metathoracic wings fully developed.

Legs. Anterior tarsomeres 1–3 feebly widened, anterior tibiae slightly widened antero-laterally, lobe-shaped there. All tibiae setose laterally; setae longer than lateral tibial spines.

Hind femora toothed on posterior outline.

Genitalia. Aedeagus as in Figure 1.

Variation. Anterior tarsomeres not widened; posterior femora simple in females. The majority of the paratypes unicoloured, reddish-yellow; some of them with darker elytra, or darker head and elytra than the rest of dorsum. The colour of antennae very minutely varies. Antennal club in a few paratypes very slightly darker than the rest of antennae, usually red-yellowish, rarely very lightly brown-yellowish. Rarely margins of club antennomeres infuscate in some paratypes. Width of last antennomere varies in a small range. The ratio of width of antennomeres 10:11 varies between 1.1 and 1.4 in males and between 1.2 and 1.4 in females. The most frequent ratio is 1.2 in both sexes. The data were taken from 20 male and 20 female paratypes. The ratio of width of pronotum:head varies between 1.5–1.7 in both sexes; the most frequent ratio detected is 1.6 in both sexes. The data were taken from 20 male and 20 female paratypes. Punctured primary rows and the rows of intervals as well regularly



Plates 1–2. 1: *Hydnobius vanharteni* Švec nov. spec.; 2: *Sogda hirta* Švec nov. spec.

developed on whole elytral surface in the majority of the paratypes. Elytral puncturation extremely dense; punctures connected with each other in one of the female paratype. Sutural stria very long in one of the paratypes, reaching anterior fifth of elytral length. Tooth on hind femora varies in males in coordination with the size of body. The larger the body, the larger the femoral tooth usually. Aedeagus predominantly of the same shape as in the holotype, pointed in some of the paratypes.

Differential diagnosis: *Hydnobius vanharteni* nov. spec. belongs to the species group of *Hydnobius punctatus* (Sturm, 1807); *H. spinipes* (Gyllenhal, 1813) and *H. septentrionalis* Thomson, 1874), characterized by widely rounded hind pronotal angles, moderately developed antennal club and not strikingly broadened head. *H. vanharteni* differs from *H. punctatus* and *H. spinipes* by the unicoloured antenna and by the absence of the elytral strigosity, while antennal club is dark or even black and elytral transversal strigosites are present at least laterally on elytra in both latter species. *H. vanharteni* differs from *H. septentrionalis* by elytral punctures arranged in the primary rows that are of the same size and intensity as those in intervals, while interval punctures are distinctly finer than those in the primary rows in *H. septentrionalis*. Also the shape of aedeagus shows specific characters in *H. vanharteni*.

Distribution: United Arab Emirates.

Derivatio nominis: The new species is dedicated to its collector, Antonius van Harten.

***Sogda (Trichohydnobius) hirta* Švec nov. spec.**

Plate 2, Figures 2, 4

Specimens examined. Holotype: ♂, United Arab Emirates, Wadi Wurayah farm, 25°24'N 56°19'E, 15.i–22.ii.2009, in light trap, leg. A. van Harten, ZSPC. Paratypes: 4♀, same collecting data. 1♀, Wadi Maidaq, 22.xii.2005–2.ii.2006, LT. 2♀, Wadi Wurayah, 10–26.xii.2006, WT.

Description: Oblong oval, length 2.3–3.1 mm, in holotype 2.3 mm, head 0.3 mm, pronotum 0.6 mm, elytra 1.4 mm, antenna 0.7 mm, maximum width of head 0.7 mm, pronotum 1.0 mm at basal third, elytra 1.2 mm between anterior fifth and posterior third of their length.

Dorsum yellowish-brown, legs and antennomeres 1–6 yellowish-red, antennal club brown. Venter light chestnut.

No microsculpture but puncturation presents on dorsum; whole dorsum densely haired.

Head. Distinctly coarsely densely punctured, punctures separated by about 0.5 times their own diameter; becoming sparser anteriorly. Hairs recumbent, oriented caudally.

Ratios of length of antennomeres 2–11 (2nd antennomere equal to 1.0): 1.0-0.9-0.4-0.4-0.4-1.3-0.2-1.1-1.1-1.4. Ratios of width of antennomeres 2–11 (2nd antennomere equal to 1.0): 1.0-1.0-1.0-1.1-1.4-2.4-1.7-2.6-2.4-2.1. Ratios width: length of club antennomeres: 1.4-6.0-1.8-1.7-1.2.

Pronotum. Hind angles blunt, very widely rounded, therefore angles almost indistinct in dorsal view, very blunt and rounded, feebly detectable laterally seen. Base straight. Punctured similarly as on head, punctures separated by about 0.5–1.0 times their own diameter. Punctures bear semirerected setae oriented caudally on disc, latero-caudally on lateral parts of pronotum.

Scutellum. With single puncture.

Elytra. Punctured; punctures similar to those on pronotum; arranged in rows. Punctures separated by about 0.5 times their own diameter. Rows less regular close to base. Elytral intervals with punctures of the same size and intensity as those in rows; arranged similarly as punctures in primary rows. Punctures bear semierect setae oriented latero-caudally. Sutural stria developed, terminating approximately at the middle of elytral length. Epipleurae with sparse setae shorter than those on dorsum of elytra.

Metathoracic wings fully developed.

Legs. Anterior tarsomeres 1–4 feebly widened, anterior tibiae slightly widened antero-laterally lobe-shaped there. All tibiae setose laterally, setae longer than lateral tibial spines. Hind femora toothed at basal third; concave toward apex of posterior outline.

Genitalia. Male and female genitalia as in Figures 2 and 4.

Variation. Anterior tarsomeres not widened, posterior femora simply edged at posterior margin in females. Elytral rows feebly developed, mostly irregular; elytral punctures separated by 0.5–1.5 times their own diameter in some paratypes, very densely arranged, connecting with each other in some places in one of the paratypes.

Differential diagnosis: *Sogda hirta* nov. spec. differs from all known species of the genus by distinctly setose dorsum, while dorsal surface of the other species is hairless or at most with few setae.

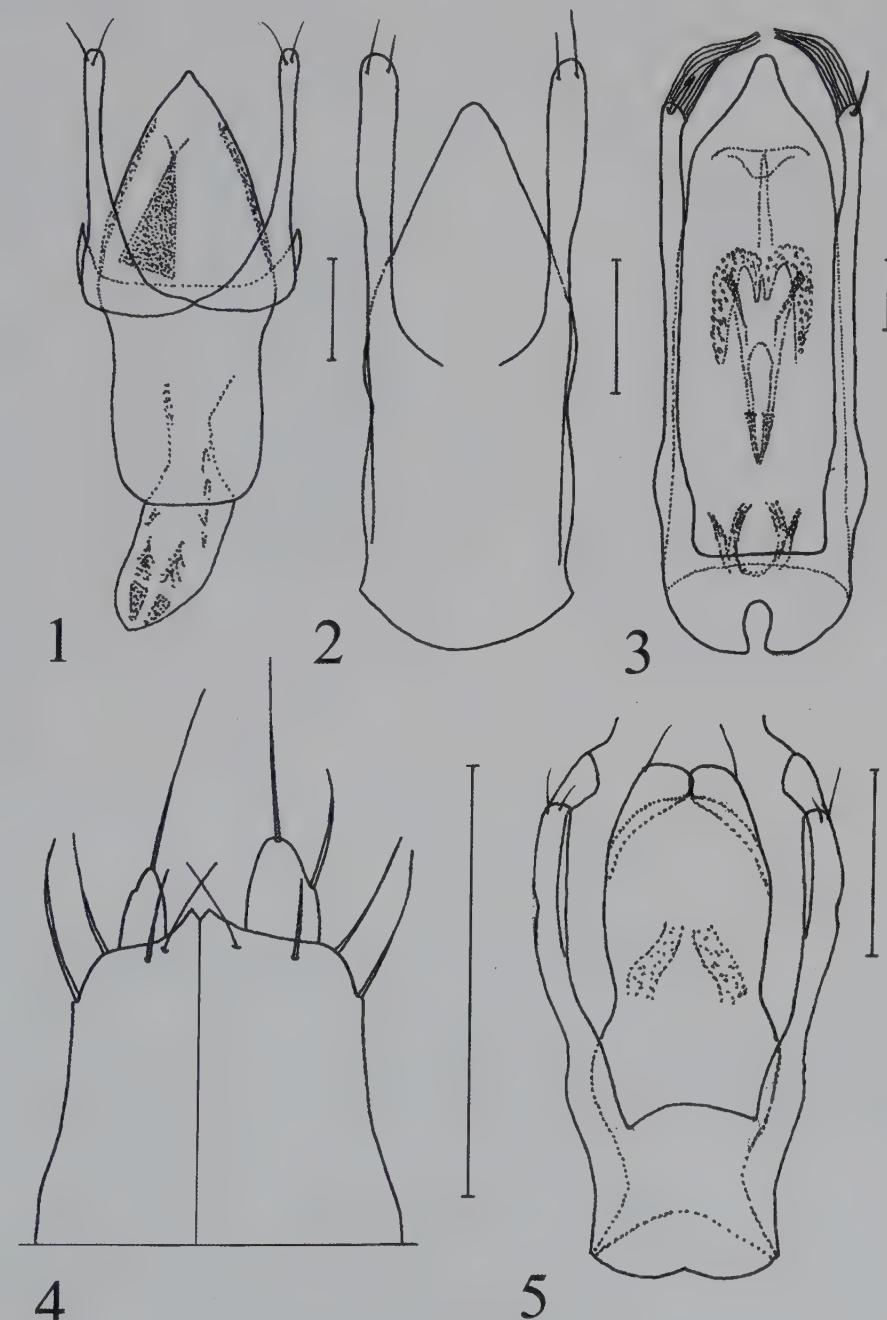
Distribution: United Arab Emirates.

Derivatio nominis: The name of the new species should attract attention to the hairy dorsum of the species.

***Leiodes antoniusi* Švec nov. spec.**

Plate 3, Figure 3

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Safad, 25°13'N 56°19'E, 26.iv–4.v.2006, in light trap, leg. A. van Harten, ZSPC. Paratypes: 15♂, 10♀, same collecting data. 2♀, Wadi Bih dam, 1–8.iii.2007, LT. 1♂, Wadi Wurayah farm, 15.i–22.ii.2009, LT.



Figures 1–5. 1–3, 5: Aedeagus dorsally; 4: Top of ovipositor. 1: *Hydnobius vanharteni* Švec nov. spec.; 2, 4: *Sogda hirta* Švec nov. spec.; 3: *Leiodes antoniusi* Švec nov. spec.; 5: *Liocyrtusa globosa* Švec nov. spec.

Description: Length 2.5–3.3 mm, in holotype 3.1 mm, head 0.4 mm, pronotum 0.8 mm, elytra 1.9 mm, antenna 0.9 mm. Maximum width of head 0.8 mm, pronotum 1.5 mm at base, elytra 1.6 mm at basal fourth. Oblong oval, yellowish-red including appendages. Antennae unicoloured. Head besides puncturation with traces of microsculpture; elytra transversely strigose. Underside yellowish-red, trochanterae darker.

Head. Distinctly punctured, punctures separated by about 1–2 times their own diameter. Beside basal puncturation two pairs of large punctures present on vertex. Ratios of length of antennomeres 2 to 11 (the 2nd equal to 1.0) = 1.0-1.6-0.8-0.8-0.7-1.3-0.4-1.4-1.3-2.2. Last antennomere somewhat narrower than antennomere 10. Ratios of width of antennomeres 2 to 11 (2nd equal to 1.0): 1.0-1.0-1.0-1.1-1.1-2.3-1.4-2.8-3.0-2.8. Ratios of width: length of the club antennomeres: 1.2-2.5-1.4-1.6-0.9.

Pronotum. Lateral margins roundly tapered toward anterior angles. Base straight. Posterior angles blunt rounded in dorsal view. In lateral view lateral margins arcuate; posterior angles blunt, widely rounded. Punctuation distinct, strong. Punctures separated by 2–4 times their own diameter. Some large punctures irregularly scattered before base.

Scutellum. Distinctly punctured, punctures separated by about 1–2 times their own diameter. Elytra. Elytral surface with regular well expressed rows of punctures. Punctures arranged in rows separated by about 0.5 times of their own diameter on disc, apically punctures smaller and sparser than on disc, laterally punctures shallower. Ninth row of punctures parallel to lateral margin, joining lateral channel at basal fourth of elytral length. Elytral intervals distinctly simply punctured by punctures smaller than those in rows; interval punctures separated by about 2 times their own diameter. Punctures transversely connected by strigosites. Strigosites lacking in close neighbourhood of scutellum. Odd intervals with scattered punctures of size and intensity as those of elytral rows. Lateral margins with punctures of usual size and intensity. Sutural stria clearly impressed and extending approximately to basal fourth. Epipleurae without detectable setae.

Legs. Anterior tarsomeres 1–4 slightly dilated in male. Anterior tibiae with thin, simply curved terminal medial spine, longer than tarsomere 1. Posterior tibiae simply curved, posterior femora with small pointed lobe-shape dilatation dorso-distally.

Mesosternum. Mesosternal carina of type A (sensu Švec, 2008).

Male genitalia. Aedeagus as in Figure 3.

Variation. Dorsum yellowish to light chestnut. Antennae yellowish to reddish; unicolourous.

Differential diagnosis: *Leiodes antoniusi* nov. spec. is similar to *L. pilifera* (Reitter, 1884) by the presence of transverse strigosites, oblong shape of body, by the same or a little narrower width of last antennomere than antennomere 10, by the light antennal club and by the mesosternal carina of type A. It differs by widely rounded posterior pronotal angles, that are pointed and rectangular in the compared species. *L. antoniusi* differs from *L. pilifera* also by denser puncturation of pronotum and elytra. Also male genitalia show specific characters in *L. antoniusi*.

Distribution: United Arab Emirates.

Derivatio nominis: The new species is named after its collector, Antonius van Harten.

Liocyrtusa globosa Švec nov. spec.

Plate 4, Figure 5

Specimens examined. Holotype: ♂, United Arab Emirates, Bithnah, 25°10'N 56°14'E, 31.xii.2005–2.ii.2006, in light trap, leg. A. van Harten, ZSPC.

Description: Length 1.7 mm, head 0.2 mm, pronotum 0.4 mm, elytra 1.1 mm, antenna 0.5 mm. Maximum width of head 0.5 mm, pronotum 0.9 mm at base, elytra 0.9 mm at basal fifth. Broad oval, brownish-yellow. Antennomeres 7–10 dark, antennomere 11 infuscate.



Plate 3-4. 3: *Leiodes antoniusi* Švec nov. spec.; 4: *Liocyrtusa globosa* Švec nov. spec.

unicoloured. Head with traces of microsculpture; pronotum feebly but distinctly and base of elytra superficially microreticulate. Underside brownish-yellow coxae and metasternal process brown.

Head. Distinctly punctured, punctures separated by about 1–2 times their own diameter. Some small punctures interposed. Besides basal puncturation a pair of large punctures present between eyes. Ratios of length of antennomeres 2 to 11 (the 2nd equal to 1.0) = 1.0-0.8-0.4-0.3-0.3-0.8-0.1-0.8-0.8-1.0. Last antennal segment distinctly narrower than segment 10. Ratios of width of antennomeres 2 to 11 (2nd equal to 1.0): 1.0-1.0-1.0-1.0-1.0-2.8-1.4-3.8-3.8-3.0. Ratios of width: length of the antennal club segments: 1.8-7.0-2.4-2.4-1.5.

Pronotum. Lateral margins roundly tapered toward anterior angles. Base straight. Posterior angles slightly acute, widely rounded in dorsal view. In lateral view lateral margins arcuate; posterior angles blunt, rounded. Puncturation less expressed than on head; punctures separated by 3–4 times their own diameter. Some punctures equipped with short unobtrusive seta.

Scutellum. Punctured as on pronotum.

Elytra. Elytral surface with punctured rows. Primary rows 1 and 2 regular on disc, shortened anteriorly, not reaching base of elytra, somewhat irregular posteriorly. Punctures in rows



Plate 5. *Chobautiella anisotomoides* (Fairmaire, 1876).

separated by about 0.5–1.0 times their own diameter. Elytral intervals distinctly simply punctured by punctures smaller than those in rows; interval punctures separated by about 3–4 times their own diameter, tending to seriate in two irregular rows in some places. Sutural stria clearly impressed and extending approximately to half of elytral length. Rare short unobtrusive setae disseminated on dorsal surface of elytra.

Legs. Anterior tarsomeres 1–3 slightly dilated. Anterior tibiae straight. Mid-tibiae simply curved, broadened distally. Posterior tibiae straight.

Male genitalia. Aedeagus as in Figure 5.

Differential diagnosis: *Liocyrtusa globosa* nov. spec. is similar to *L. vittata* (Curtis, 1840) in dorsal sculpture. It differs by the straight base of pronotum, that is antero-laterally oblique before hind angles in *L. vittata*. *L. globosa* differs also by parameres that are shorter than median lobe, not taking into account parameral appendices, while in *L. vittata* parameres are as long as median lobe.

Distribution: United Arab Emirates.

Derivatio nominis: The name of the new species resembles shape of body.

Chobautiella anisotomooides (Fairmaire, 1876)

Plate 5

Specimens examined: Sharjah Desert Park, 1♂, 14.ii–1.iv.2008, LT. TUNISIA: Ksar Hadada, S of Medenine, 13–14.iv.1996, leg. J. Batelka & H. Podroužková.

Distribution: Canary Islands, Morocco, Algeria. First records for the Arabian Peninsula and for Tunisia.

ACKNOWLEDGEMENTS

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Order Coleoptera, family Bostrichidae

Michael Geisthardt

INTRODUCTION

The Bostrichid family has a world-wide distribution, about 620 species having been described. About 160 species and subspecies of the Bostrichidae are known from the Palaearctic, but only a few taxa have been recorded for the Arabian Peninsula (Beccari, 1971; Damoiseau, 1979; Lesne, 1935; Shalaby, 1961; Walker, 1871). The Bostrichid fauna of the UAE has been poorly researched until recently. Van Harten (2005) indicates no definitive species. Due to the intensive research of Mr. Antonius van Harten our knowledge concerning this family has considerably increased, at least as far as the faunistic inventory of the UAE is concerned.

The Lyctidae have recently been regarded as being a subfamily of the Bostrichidae. They are called ‘powder-post beetles’ because their larvae attack sapwood, especially that of hardwoods, and reduce the wood to powder within a few generations. Only a thin veneer of the wood on the outside is left uneaten. The main foodstuff utilized by the polyphagous larvae is starch, also certain sugars and protein are necessary for the development. The larvae are unable to digest cellulose, hemicellulose and lignin. Through commerce in timber many species have been dispersed and are today established in additional faunal regions.

The Bostrichinae (black stem borers, wood borers) primarily attack wood, and together with the powder-post beetles (Lyctinae) are the most serious pest infesting and destroying wood both in the natural environment as well as in man-made constructions. Moreover some species are known also as serious pests of grain, grain products, seeds, cassava, sweet potatoes, etc. Like the Lyctinae the Bostrichinae do not digest cellulose. But in contrast to the Lyctinae, which are exclusively wood-boring as larvae, the adults of the wood borers tunnel as well as the larvae. In the Bostrichinae there is in general a very distinct sexual dimorphism (shape of prothorax, pubescence, etc), but with regard to the present paper this fact was not taken into consideration.

In comparison with the extremely poor records of Bostrichidae for the UAE, the material sampled by A. van Harten, collected during the last few years, is a very well maintained collection. However, due to the biased methods of collection (light and Malaise traps) our knowledge about the actual number of taxa of this family remains fragmentary. Moreover, nothing can be said of the ecology of this group and the host plants it attacks in the UAE. This paper records 16 species for the fauna of the UAE, 14 of which are recorded for the first time from the country. Furthermore five species are new to the fauna of the Arabian Peninsula. The Bostrichid fauna of the UAE resembles that of Yemen though it is distinctly less rich.

MATERIALS AND METHODS

Unless otherwise indicated, the specimens have been collected by A. van Harten. The sex of the specimens only partly has been recorded, which is why in this paper the total number of specimens is stated. There is, however, the impression that males are in general more attracted by light than females. Biological and ecological data given in this paper are cited from the literature.

The specimens recorded in this paper will be partly deposited in the author's collection and partly in the United Arab Emirates Invertebrate Collection.

Abbreviation used in the text: NARC = National Avian Research Centre, LT = light trap, MT = Malaise trap. Detailed information concerning the localities mentioned in this paper are given in the first and second volume of this monograph. The species are listed in alphabetical order separated into the two subfamilies Bostrichinae and Lyctinae.

SYSTEMATIC ACCOUNT

Subfamily **Bostrichinae** Latreille, 1802

Bostrychoplites normandi yemenensis Lesne, 1935

Plate 1

Specimens examined: Wadi Hayl, 1 ex., 5.x.2007, leg. J. Batelka & H. Pinda.

Length: 7.0–9.0 mm.

Ecology and biology: Nothing is known about the biology; *B. normandi normandi* Lesne, 1897, seems to be nocturnal and is attracted by light. The nominate subspecies is widely distributed in the Sahara and has been found attacking wooden constructions. The host plants are unknown.

Distribution: Yemen. New record for the UAE.

Bostrychoplites zickeli (Marseul, 1867)

Plates 2–3, 20

Specimens examined: Fujairah, 1 ex., 5.vi–2.vii.2005, LT. Hatta, 1 ex., 8–26.iv.2006, LT. Sharjah–Khor Kalba, near tunnel, 1 ex., 7–22.iii.2007, LT. Sharjah Desert Park, 1 ex., 29.iii–6.iv.2005; 5 ex., 6–30.iv.2005; 5 ex., 30.iv–31.v.2005; 5 ex., 31.v–30.vi.2005, all in LT. Wadi Maidaq, 4 ex., 27.iv–4.v.2006, LT; 1 ex., 17–24.vi.2006, LT; 2 ex., 1–8.vii.2006, LT.

Length: 4.5–23 mm.

Ecology and biology: The species is nocturnal, and the adults are active between 8 and 10 p.m. in the Northern Sahara (Lesne, 1924). The beetle attacks dry leaflets and dry wood of the date palm (*Phoenix dactylifera*) and Passifloraceae (pomegranate, passion flower, granadilla).

Distribution: Saharo-Saharan species (North Africa, known from West to East Africa south of the Sahara [Mauretania, Senegal, Chad, Ethiopia, Somalia, Kenya]). Recorded also from Saudi Arabia and Yemen. New record for the UAE.

Bostrychopsis reichei (Marseul, 1867)

Plates 4–5

Specimens examined: Fujairah, 2 ex., 16–23.vii.2005, LT. Sharjah, 1 ex., 12–28.vi.2005, LT. Sharjah Desert Park, 1 ex., 30.iv–31.v.2005, LT; 9 ex., 30.vi–21.vii.2005, LT. Wadi Maidaq, 1 ex., 1–8.vii.2006, LT.

Length: 6.0–12 mm.

Ecology and biology: The beetle develops in axils and dry leaflets of date palms and cotton stalks; in Egypt it is a pest. Attacked are also *Acacia arabica*, *Albizia lebbek* (Mimosaceae), *Bambusa bambos* (Gramineae), *Haematoxylon campechianum*, *Delonix regia* (Caesalpiniaceae), and *Ricinus communis* (Euphorbiaceae) (Helal et al., 1986). Under good conditions there are three generations a year.

Distribution: Afrotropical species, also known from some North African regions and from Saudi Arabia. Observed in Yemen (1993, Geisthardt unpublished). New record for the UAE.

Calopertha truncatula (Ancey, 1881)

Plate 6

Specimens examined: Al-Ajban, 8 ex., 10–17.x.2005, MT & LT; 2 ex., 17.x–9.xi.2005, LT; 1 ex., 22.x–9.xi.2005, MT; 8 ex., 9.xi–7.xii.2005, MT & LT; 4 ex., 26.ii–27.iii.2006, LT; 3 ex., 15–22.v.2006, LT; 9



Plate 1: *Bostrychoplites normandi yemenensis* Lesne, habitus, dorsal view.

ex., 27.v–26.vi.2006, MT; 6 ex., 26.vi–25.vii.2007, MT. Bithnah, 6 ex., 31.xii.2005–2.ii.2006, LT. Fujairah, 7 ex., 6.iv–2.v.2005, LT; 3 ex., 2.v–5.vi.2005, LT; 1 ex., 5.vi–2.vii.2005, LT; 1 ex., 28.ii–1.iv.2006, LT. Hatta, 1 ex., 19–28.iii.2006, LT. Khor al-Khwair, 1 ex., 16–23.v.2007, LT. Near Mahafiz, SSW of ad-Dhaid, 6 ex., 24–30.v.2006, LT. Sharjah Desert Park, 1 ex., 25.i–22.2005, LT; 1 ex., 22.ii–9.iii.2005, LT; 10 ex., 29.iii–6.iv.2005, LT; 18 ex., 6–30.iv.2005, LT; 11 ex., 30.iv–31.v.2005, LT; 5 ex., 31.v–30.vi.2005, LT; 1 ex., 11.xii.2005–18.i.2006, LT; 6 ex., 18.iii–8.iv.2007, LT; Sharjah–Khor Kalba, near tunnel, 5 ex., 16–31.i.2006, LT; 4 ex., 7–22.iii.2006, LT; NARC, near Sweihan, 6 ex., 1.ii–14.iii.2005, LT; 15 ex., 14.iii–2.iv.2005, LT; 8 ex., 2–30.iv.2005, LT; 2 ex., 11–21.v.2005, LT; 1 ex., 27.iii–30.iv.2006, LT; 2 ex., 15.xi–21.xii.2006; LT. Wadi Bih dam, 1 ex., 23.ix.2007, leg. J. Batelka & H. Pinda. Wadi Hayl, 1 ex., 5.x.2007, leg. J. Batelka & H. Pinda. Wadi Maidaq, 10 ex., 2–16.ii.2006, LT; 1 ex., 14.iii.2006, leg. H. Pohl; 2 ex., 27.iv–1.v.2006, LT; 4 ex., 1–8.vii.2006, LT. Wadi Safad, 3 ex., 20.xii.2005–2.i.2006, LT; 4 ex., 14–21.v.2006, LT; 2 ex., 1–8.vii.2006, LT.

Length: 3.2–4.5 mm.

Ecology and biology: The species breeds in several *Acacia* spp. (Mimosaceae). The Histerid beetle *Teretriosoma intrusum* (Marseul, 1870) is reported being a predator of *C. truncatula* (Mateu, 1975). Also several *Teretrius* species (Histeridae) probably are predacious attacking Bostrichidae, especially the genus *Calopertha* Lesne, 1906. One of these African species, *T. pulex* Fairmaire, 1877, has been recorded from the UAE (Kanaar, 2007).

Remarks: A closely related African species, *Calopertha subretusa* (Ancey, 1881), has been reported from Yemen (Lesne, 1924). It has been collected abundantly by van Harten from 2001 to 2003 in light traps at different places in Yemen (specimens in the collection of the author), but at present no records are known for the UAE.

Distribution: A widespread African species, also known from Saudi Arabia and Yemen. New record for the UAE.



2



3

Plates 2–3. *Bostrychoplites zickeli* (Marseul), habitus. 2: Dorsal view; 3: Lateral view.



4



5

Plates 4–5. *Bostrychopsis reichei* (Marseul), habitus. 4: Dorsal view; 5: Lateral view.



Plate 6. *Calopertha truncatula* (Ancey), habitus, lateral view.

***Enneadesmus forficula* Fairmaire, 1883**

Figures 1, 5

Specimens examined: Hatta, 1 ex., 22–29.i.2006, LT; 3 ex., 8–26.iv.2006, LT. Khor al-Khwair, 4 ex., 2–13.v.2007, LT. Sharjah-Khor Kalba, near tunnel, 4 ex., 16–31.i.2006, LT; 6 ex., 7–22.iii.2006, LT. Wadi Maidaq, 3 ex., 21.xii.2005–2.ii.2006, LT; 11 ex., 2–16.ii.2006, LT; 8 ex., 27.iv–4.v.2006, LT; 2 ex., 1–8.vii.2006, LT. Wadi Safad, 8 ex., 27.xi–22.xii.2005, LT; 22–31.xii.2005, LT; 3 ex., 14–21.v.2006, LT; 4 ex., 17–24.vi.2006, LT; 12 ex., 1–8.vii.2006, LT.

Length: 3.5–5.0 mm.

Ecology and biology: In general, several *Acacia* spp. (*Mimosaceae*) are attacked by this nocturnal species. But the beetle is considered also to attack citrus trees (Halperin & Damoiseau, 1980). The species obviously prefers very dry wood. The beetle is a very strong flier, is active at night and the male is attracted to light. Larvae and adults fall victim to predacious Cleridae and Histeridae (Coleoptera) as well as Bethylidae (Hymenoptera).

Distribution: A common African and Oriental species, recorded from Saudi Arabia and Yemen. New record for the UAE

***Enneadesmus obtusidentatus* (Lesne, 1899)**

Plate 7, Figure 7

Specimens examined: Hatta, 1 ex., 19–28.iii.2006, LT. Sharjah-Khor Kalba, near tunnel, 2 ex., 7–22.iii.2006, LT.

Body length: 3.5–5.0 mm.

Ecology and biology: Biological data are not available.

Distribution: Egypt, Sudan, Iraq, Saudi Arabia, Syria, Yemen. New record for the UAE.

***Enneadesmus trispinosus* (Olivier, 1795)**

Plate 8, Figures 6, 8

Specimens examined: Fujairah, 3 ex., 5.iii–6.iv.2005, LT; 1 ex., 6.iv–2.v.2005, LT; 1 ex., 2.v–5.vi.2005, LT. Hatta, 1 ex., 8–26.iv.2006, LT.

Length: 2.0–3.5 mm.

Ecology and biology: Only a little is known about this species. It seems to be an eremian element attacking *Acacia* spp. (Mimosaceae), *Tamarix* spp. (Tamaricaceae), and *Phoenix dactylifera* (Palmae) (Lesne, 1901). From Northern Sinai the species has been recorded attacking date palm trees. It bores into leaf mid-ribs and female flower fronds the whole year. But so far as is known the infestation is rare.

Distribution: Holomediterranean element; distributed from Spain and Morocco in the West to Libya in the East, collected also in the Sahara (Vrydagh, 1953). Observed in Yemen by Geisthardt (1993, unpublished). New for the fauna of the Arabian Peninsula. New record for the UAE.

***Phonapate uncinata uncinata* (Karsch, 1881)**

Plates 9, 21, 23

Specimens examined: Al-Ajban, 1 ex., 22.x–9.xi.2005, MT; 1 ex.; 2–9.iv.2006, MT. Hatta, 1 ex., 8–26.iv.2006, LT. Near Mahafiz, SSW of ad-Dhaid, 3 ex., 24–30.v.2006, LT. Sharjah Desert Park, 1 ex.; 30.iv–31.v.2005, LT. NARC, near Sweihan, 1 ex., 2–30.iv.2005, LT. Wadi Midaq, 4 ex., 27.iv–4.v.2006, LT. Wadi Safad, 1 ex., 14–21.v.2006, LT.

Length:

Ecology and biology: The species has been recorded attacking date palms (*Phoenix dactylifera*), *Tamarix gallica* and *Bambusa* spp. (Puebla et al., 2007). In Egypt it is a pest on date palm trees, excavating the leaf mid-ribs as well as the female flower fronds the whole year. Concerning the UAE no biological data are available.

Distribution: Holomediterranean element, recorded for Egypt, Israel, Libya, Iraq and tropical Africa. Also known from the whole Arabian Peninsula.

***Rhyzopertha dominica* (Fabricius, 1792)**

Plate 10, Figure 2

Specimens examined: Al-Ajban, 1 ex., 10–17.x.2005, MT; 10 ex., 17.x–9.xi.2005, LT; 7 ex., 9.xi–7.12.2005, MT; 12 ex., 6–22.v.2006, LT. Fujairah, 1 ex., 6.iv–2.v.2005, LT; 2 ex., 5.vi–2.vii.2005, LT; 6 ex., 20–27.v.2006, LT. Hatta, 2 ex., 8–26.iv.2006, LT. Sharjah, 1 ex., 11–18.x.2004, LT; 16 ex., 27.iv–5.vii.2005, LT; 4 ex., 12–28.vi.2005, LT; 7 ex., 24.ix–9.x.2005, LT. Sharjah Desert Park, 1 ex., 29.iii–6.iv.2005, LT. NARC, near Sweihan, 1 ex., 2–30.iv.2005, LT. Wadi Midaq, 1 ex., 2–16.ii.2006, LT. Wadi Safad, 1 ex., 20.xii.2005–2.i.2006, LT; 4 ex., 14–21.v.2006, LT.

Length: 1.9–3.2 mm.

Ecology and biology: A comprehensive account of the biology of the lesser grain borer has been published by Potter (1935) and a short one by Geisthardt & van Harten (1992). This species is a very serious pest of starchy grains, tubers, seeds and wood. *Rh. dominica* is a polyphagous species attacking all kinds of grain (wheat, barley, rice, maize, millet, oats, including the ground products of these grains) and on dried potatoes, manioc roots, lentils, beans, biscuits, stored drugs etc. Therefore it is of great economic importance. In stores *R. dominica* is usually associated with the cosmopolitan *Sitophilus oryzae* (Linnaeus, 1763) (Curculionidae) [rice weevil, black weevil]. The species also attacks a number of trees: *Acacia* spp. (Mimosaceae), *Alnus* spp. (Betulaceae), *Bambusa* spp. (Gramineae), *Quassia* spp. (Simarubaceae), *Bauhinia* spp. (Caesalpiniaceae), *Cytisus* (Fabaceae), etc. In Yemen this species has been observed in tremendous numbers in wheat flour, imported wheat, maize, sorghum, rice and seeds (Geisthardt, 1993, unpublished). Under good conditions there are up to five generations per year; the optimum conditions for development are 30°C and 30–37% relative humidity. Ecological data concerning the UAE are not available.



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Plates 7–8. 7: *Enneadesmus obtusidentatus* (Lesne), habitus; 8: *Enneadesmus trispinosus* (Olivier), habitus.

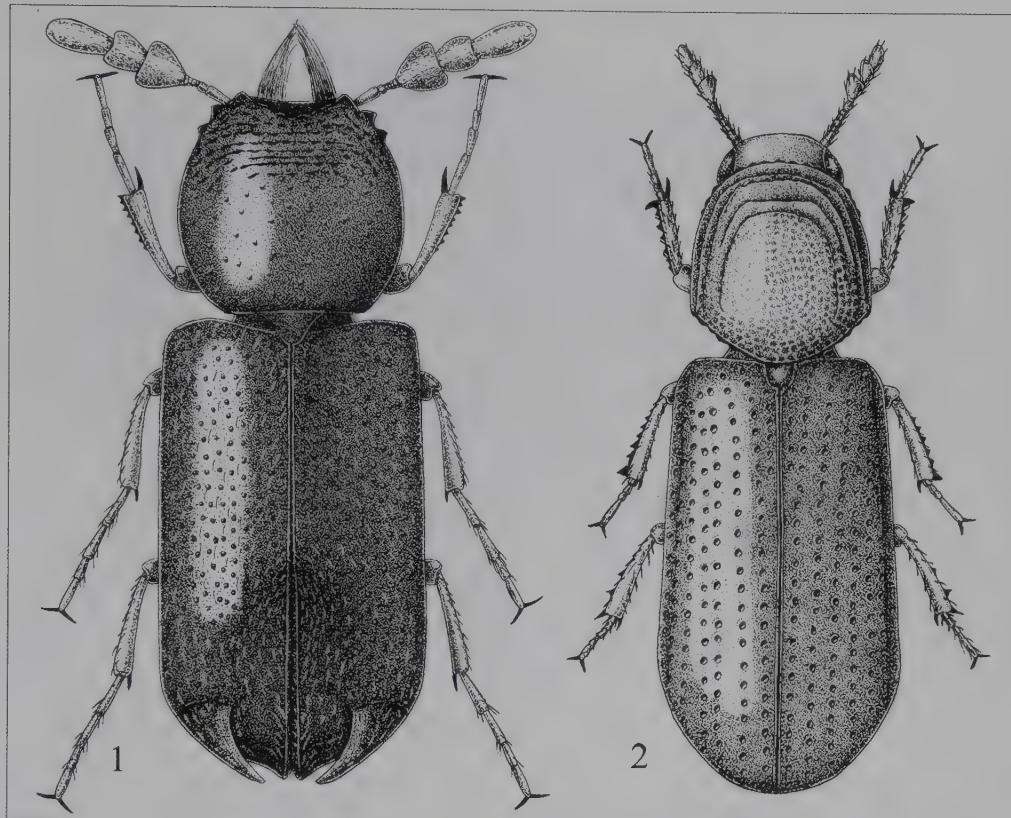


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Plates 9–10. 9: *Phonapate uncinata uncinata* (Karsch), habitus; 10: *Rhyzopertha dominica* (Fabricius), habitus.



Figures 1–2. 1: *Enneadesmus forficula* Fairmaire, habitus; 2: *Rhyzopertha dominica* (Fabricius), habitus. (Both ex Geisthardt & van Harten, 1992)

Distribution: Cosmopolitan species, recorded also from Saudi Arabia and Yemen. New record for the UAE.

***Sinoxylon ceratoniae* (Linnaeus, 1758)**

Specimens examined: 7 km S of al-Jazirat al-Hamra, 1 ex., 4.i.2005, hand-collecting. Al-Ajban, 1 ex., 15–22.v.2006, LT; 1 ex., 26.vi–25.vii.2007, MT. Fujairah, 1 ex., 6.iv–2.v.2005, LT; 1 ex., 28.ii–1.iv.2006, LT; 1 ex., 20–27.v.2006, LT. Sharjah, 8 ex., 27.iv–5.vi.2005, LT; 7 ex., 12–28.vi.2005, LT; 3 ex., 24.ix–9.x.2005, LT; Sharjah Desert Park, 2 ex., 30.iv–31.v.2005, LT; 5 ex., 31.v–30.vi.2005, LT; 1 ex., 11.xii.2005–18.i.2006, LT; 1 ex., 17–24.iii.2007, LT.

Length: 3.5–5.5 mm.

Ecology and biology: The eremian species develops in several Mimosaceae (*Acacia* spp., *Albizia* spp., *Faidherbia* spp., *Prosopis* spp.), Caesalpiniaceae (*Ceratonia* spp., *Parkinsonia* spp.) and Fabaceae (*Dalbergia* spp., *Robinia* spp.) and also in some other families. In West Africa this species is a serious pest of *Acacia*-trees, and in Mozambique it is known as a pest of cassava tubers (Carvalho, 1979). Ecological data concerning the UAE are not available.

Distribution: Africa, including North Africa; known from the whole Arabian Peninsula.

Plate 11. Figures 3, 9



Plate 11. *Sinoxylon ceratoniae* (Linnaeus), habitus, lateral view.

***Sinoxylon pugnax* Lesne, 1904**

Plates 12–13, 24

Specimens examined: Al-Ajban, 2 ex., 10–17.x.2005, MT & LT; 2 ex., 17.x–9.xi.2005, LT; 1 ex., 6–22.v.2006, LT; 4 ex., 27.v–26.vi.2006, MT; 4 ex., 26.vi–25.vii.2007, MT. Fujairah, 5 ex., 6.iv–2.v.2004, LT; 1 ex., 24.ii–4.iii.2005 (\pm 4 days), LT; 4 ex., 5.iii–6.iv.2005, LT; 3 ex., 6.iv–2.v.2005, LT; 7 ex., 2.v–5.vi.2005, LT; 1 ex., 28.ii–1.iv.2006, LT. Near Mahafiz, SSW of ad-Dhaid, 2 ex., 24–30.v.2006, LT. Ra's al-Khaimah Airport, Ghaf forest, 1 ex., 27.ix.2007, leg. J. Batelka & H. Pinda. Sharjah, 1 ex., 24.ix–9.x.2005, LT. Sharjah Desert Park, 1 ex., 25.i–22.ii.2005, LT; 4 ex., 29.iii–6.iv.2005, LT; 14 ex., 6–30.iv.2005, LT; 18 ex., 30.iv–31.v.2005, LT; 4 ex., 31.v–30.vi.2005, LT; 14 ex., 30.vi–21.vii.2005, LT; 4 ex., 21.vii–5.viii.2005, LT; 2 ex., 11.xii.2005–18.i.2006, LT; 2 ex., 17–24.iii.2007, LT; 1 ex., 24.iii–3.iv.2007, LT. NARC, near Sweihan, 1 ex., 1.ii–14.iii.2005, LT; 3 ex., 14.iii–2.iv.2005, LT; 7 ex., 2–30.iv.2005, LT; 2 ex., 11–21.v.2005, LT; 2 ex., 16.xi–21.xii.2005, LT; 1 ex., 27.iii–2.v.2006, LT. Wadi Maidaq, 5 ex., 2–16.ii.2006, LT. Wadi Safad, 3 ex., 14–21.v.2006, LT; 1 ex., 17–24.vi.2006, LT; 1 ex., 1–8.vii.2006, LT.

Length: 6.0–8.5 mm.

Ecology and biology: So far as India is concerned the species attacks *Acacia* spp. and *Albizia* spp. (Mimosaceae). The species has been imported in 1997 to Canada with wood packing material (source: Canadian Forest Service). Ecological and biological data for the UAE or even the Arabian Peninsula are not available.

Distribution: Oriental species, recorded also for Afghanistan, Iran, and Pakistan. New for the Arabian Peninsula. New record for the UAE.

***Sinoxylon senegalense* Karsch, 1881**

Plate 14. Figure 10

Specimens examined: Sharjah, 12–28.vi.2005, 1 ex.

Length: 5.0–9.0 mm.



12



13

Plates 12-13. *Sinoxylon pugnax* Lesne, habitus. 12: Dorsal view; 13: Lateral view.



Plate 14: *Sinoxylon senegalense* Karsch, habitus.

Ecology and biology: Eremian species, which attacks *Acacia* spp. and *Albizia* spp. (Mimosaceae). In some regions it is known as an important destroyer of timber, but concerning the Arabian Peninsula no ecological data are available.

Remark: *S. senegalense* and *S. ceratoniae* are very closely related species, but are easily separated by the shape of the antennal club (Figs 9, 10).

Distribution: A wide spread African species, including North Africa. Recorded also for Saudi Arabia by Damoiseau (1979) and observed in the Yemen by Geisthardt (1993, unpublished). New record for the UAE.

***Xylomedes rufocoronata* (Fairmaire, 1892)**

Plates 15–16, 22, 25

Specimens examined: Khor al-Khwair, 1 ex., 2–13.v.2007; 1 ex., 16–23.v.2007. Sharjah-Khor Kalba, near tunnel, 2 ex., 16–31.i.2006; 8 ex., 7–22.iii.2006. Sharjah Desert Park, 1 ex., 25.i–22.ii.2005; 1 ex., 30.iv–31.v.2005; 3 ex., 15–25.ii.2006. Wadi Maidaq, 13 ex., 2–16.ii.2006.

Length: 14–19 mm.

Ecology and biology: This eremian species attacks several families of trees: Fabaceae, Mimosaceae, Rhamnaceae, Anacardiaceae.

Distribution: Afrotropical species but also known from several North African countries. Recorded for Saudi Arabia and Yemen. New record for the UAE.

Subfamily Lyctinae

***Acantholyctus cornifrons* (Lesne, 1898)**

Plate 17, Figure 11

Specimens examined: Al-Ajban, 7 ex., 10–17.x.2005, MT; 1 ex., 17.x–9.xi.2005, LT; 6 ex., 6–22.v.2006, LT. Fujairah, 1 ex., 24.ii–5.iii.2005, LT; 2 ex., 5.iii–6.iv.2005, LT; 4 ex., 6.iv–2.v.2005, LT;



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Plates 15-16: *Xylomedes rufocoronata* (Fairmaire). 15: Dorsal view; 16: Lateral view.



Plate 17: *Acantholyctus cornifrons* (Lesne), habitus.

3 ex., 2.v–5.vi.2005, LT; 3 ex., 5.vi–2.vii.2005, LT; 4 ex., 20–27.v.2006, LT. Hatta, 7 ex., 8–26.iv.2006, LT. Jebel Jibir, 1 ex., 28.ix.2007, leg. J. Batelka & H. Pinda. Khor al-Khwair, 2 ex., 2–13.v.2007, LT. Near Mahafiz, SSW of ad-Dhaid, 2 ex., 24–30.v.2006, LT. Sharjah, 12 ex., 11–18.x.2004, LT; 2 ex., 27.iv–5.vi.2005, LT; 10 ex., 12–28.vi.2005, LT; 2 ex., 28.vi–23.vii.2005, LT; 1 ex., 24.ix–9.x.2005, LT. Sharjah-Khor Kalba, near tunnel, 3 ex., 7–22.iii.2006, LT. Sharjah Desert Park, 1 ex., 22.ii–9.iii.2005, LT; 1 ex., 21–29.iii.2005, LT; 3 ex., 29.iii–6.iv.2005, LT; 10 ex., 6–30.iv.2005, LT; 1 ex., 30.iv–31.v.2005, LT; 9 ex., 30.vi–21.vii.2005, LT; 8 ex., 21.vii–5.viii.2005, LT; 1 ex., 11.xii.2005–18.i.2006, LT; 1 ex., 17–24.iii.2007, LT; 2 ex., 24.iii–3.iv.2007, LT. NARC, near Sweihan, 5 ex., 14.iii–2.iv.2005, LT; 2 ex., 26.ii–2.iv.2006, LT. Wadi Maidaq, 5 ex., 2–16.ii.2006, LT; 3 ex., 27.iv–4.v.2006, LT; 4 ex., 1–8.vii.2006, LT. Wadi Safad, 1 ex., 27.xi–20.xii.2005, LT; 2 ex., 20.xii.2005–2.i.2006, LT; 5 ex., 14–21.v.2006, LT; 2 ex., 1–8.vii.2006, LT.

Length: 2.3–3.0 mm.

Ecology and biology: This polyphagous species attacks only dried wood of *Acacia* spp., *Albizia* spp., *Faidherbia* spp. (Mimosaceae) and *Retama* spp. (Fabaceae). Though the species is very abundant in some regions it is not of economic importance.

Distribution: Afrotropical species, also known from Morocco, Algeria, Tunisia, Egypt, Jordania, and Israel. New for the Arabian Peninsula. New record for the UAE.

Lyctopsis scabricollis Lesne, 1911

Specimens examined: Al-Ajban, 1 ex., 10–17.x.2005, MT & LT. Fujairah, 1 ex., 6.iv–2.v.2005, LT; 1 ex., 5.vi–2.vii.2005, LT; 7 ex., 20–27.v.2006, LT. Khor al-Khwair, 1 ex., 16–23.v.2007, LT. Sharjah, 19 ex., 11–17.x.2004, LT; 8 ex., 12–28.vi.2005, LT; 1 ex., 28.vi–23.vii.2005, LT. Sharjah Desert Park, 3 ex., 29.iii–6.iv.2005, LT; 1 ex., 30.iv–31.v.2005, LT. Wadi Hayl, 1 ex., 5.x.2007, leg. J. Batelka & H. Pinda. Wadi Safad, 2 ex., 27.xi–22.xii.2005, LT; 6 ex., 14–21.v.2006, LT.

Plate 18

Length: 2.3–2.9 mm.

Ecology and biology: No biological data are available. The related *L. pachymera* Lesne, 1911 (Sahara) has been captured by Mateu (1975) from *Acacia scorpioides*.

Remarks: The specimens are on an average larger (2.4–2.9 mm) than the holotype (2.3 mm).

Distribution: This species was known only by the holotype, captured in Djibouti. According to the website of the ‘Pests and Diseases Image Library’ (Walker, 2007), this species has been found in Melbourne in 2006 in walking sticks produced in Saudi Arabia. However, there is no reference to the country of origin of the wood nor the kind of wood. New for the Arabian Peninsula. New record for the UAE.

Lyctus brunneus (Stephens, 1830)

Plate 19, Figure 4

Specimens examined: Hatta, 3 ex., 19–28.iii.2006; 3 ex., 8–26.iv.2006. Sharjah, 1 ex., 12–28.vi.2005. Wadi Maidaq, 2 ex., 27.iv–4.v.2006.

Body length: 2.2–7.0 mm.

Ecology and biology: An account is given by Gay (1953) and a survey by Geisthardt & van Harten (1992). The species flies very well and is highly attracted by light traps. More than 50 host timbers are enumerated in literature (Hickin, 1975); it attacks also manioc (cassava) and ‘common licorice’ *Glycyrrhiza glabra* (Fabaceae). Together with some Anobiid species, *L. brunneus* is one of the most serious pests of wood (also indoors) of the world. Under good conditions there are three generations a year. Biological data concerning the UAE are not available.

Distribution: Cosmopolitan. New for the Arabian Peninsula. New record for the UAE.

Key to the species of Bostrichidae recorded from the United Arab Emirates

- 1 Head hooded by the prothorax. Antennae often serrate, club of three segments. Body cylindrical; posterior end of body truncated. First abdominal sternite as long as second .. **Bostrichinae**
- Head not hooded by the prothorax. Antennae with club of two segments. Posterior end of body not truncated. First abdominal sternite longer than second **Lyctinae**

Subfamily Lyctinae

- 1 Elytra with punctures and pubescence diffuse and not seriated (Trogoxylini) (Plate 18) .. 2.3–2.9 mm *Lyctopsis scabricollis* Lesne
- Elytra with punctures and pubescence seriated, at least at sides; punctures distinct and more or less pronounced (Lyctini) 2
- 2 Frons with a small horn or cone in the middle. 2.3–3.0 mm (Plate 17, Fig. 11)..... *Acantholyctus cornifrons* (Lesne)
- Frons simple. 2.2–7.0 mm (Plate 19, Fig. 4) *Lyctus brunneus* (Stephens)

Subfamily Bostrichinae

- 1 Tarsi shorter than tibiae, with the last segment as long as, or longer than the preceding segments combined; second to fourth segment small, first minute and scarcely visible. Pronotum more or less convex, rounded or oval in front. (Dinoderini). Antennae ten-segmented. 1.9–3.2 mm (Plate 10, Fig. 2) *Rhyzopertha dominica* (Fabricius)

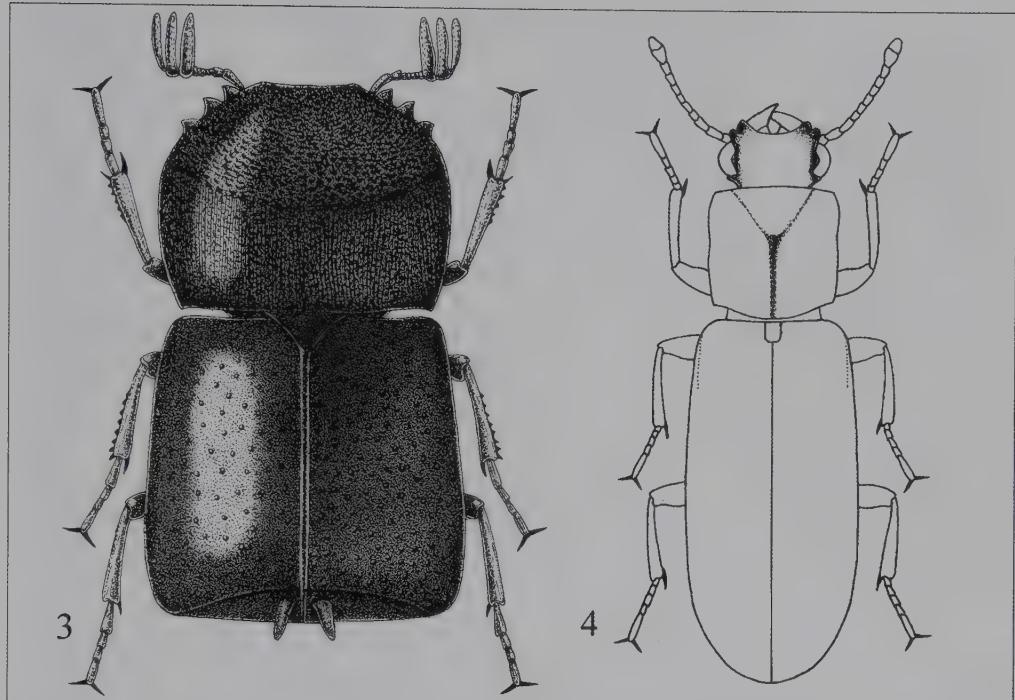


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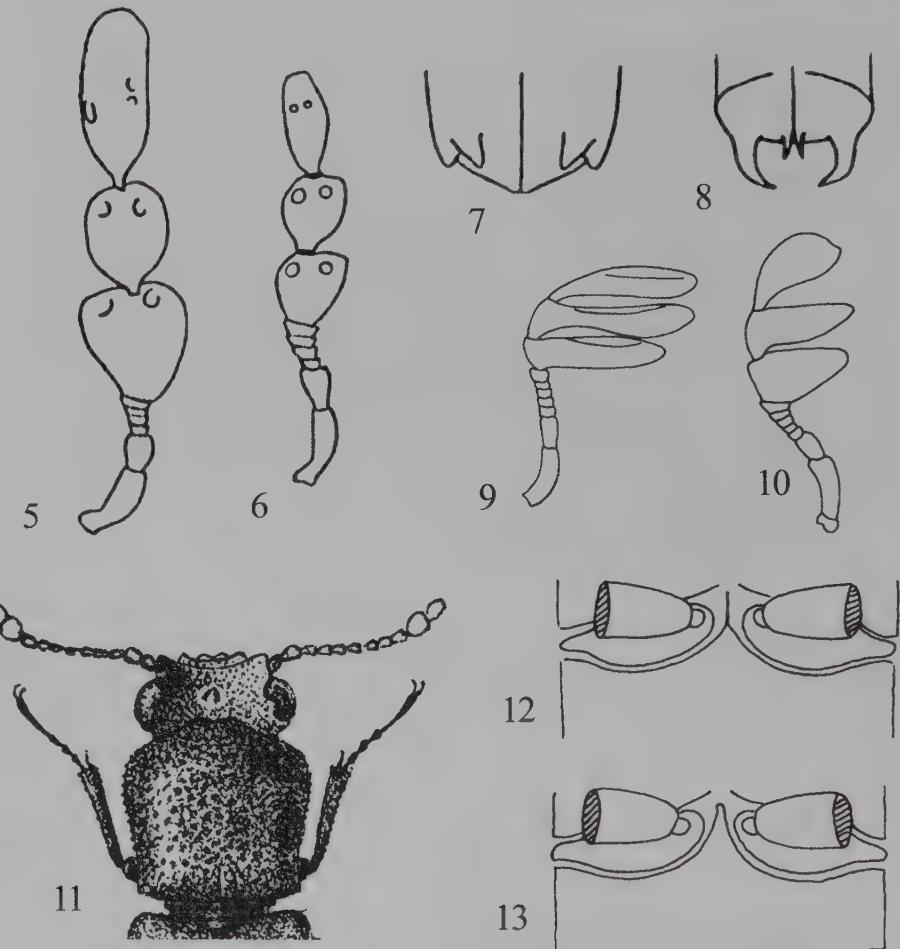
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Plates 18-19. 18: *Lyctopsis scabricollis* Lesne, habitus; 19: *Lyctus brunneus* (Stephens), habitus.



Figures 3–4. 3: *Sinoxylon ceratoniae* (Linnaeus), habitus; 4: *Lyctus brunneus* (Stephens), habitus. (Both ex Geisthardt & van Harten, 1992)

- Tarsi as long, or longer than tibiae, with the last segment shorter than the preceding segments combined, first segment small, second larger than third. Pronotum truncate or emarginate in front 2
- 2 Three-segmented antennal club not compressed (Plate 25). Females with a short, broad ovipositor. Cavities of hind coxae not margined (Apatini) 3
- Three-segmented antennal club compressed. Cavities of hind coxae margined. Females with a long, thin ovipositor 4
- 3 Abdominal sternites laterally with a fine ridge. 11–21 mm (Plates 9, 21, 23) *Phonapate uncinata* (Karsch)
- Abdominal sternites laterally without a ridge. 14–19 mm (Plates 15–16, 22, 25) *Xylomedes rufocoronata* (Fairmaire)
- 4 Intercoxal process of abdomen lamellate (Fig. 12), the hind coxae not widely separated, almost contiguous. (Xyloperthini) 5
- Intercoxal process of abdomen relatively broad, separating the hind coxae (Fig. 13). (Bostrichini, Sinoxylini) 7
- 5 Truncated posterior part of elytra apart from the lateral spines with a spine on either side very near to the suture (Plate 8, Figs 6, 8). 2.0–3.5 mm *Enneadesmus trispinosus* (Olivier)
- Truncated posterior part of elytra only with lateral spines (Fig. 1) 6



Figures 5–13. 5: Antenna of *Enneadesmus forficula* Fairmaire; 6: Antenna of *Enneadesmus trispinosus* (Olivier); 7: Apex of elytra of *Enneadesmus obtusidentatus* (Lesne); 8: Apex of elytra of *Enneadesmus trispinosus* (Olivier); 9: Antenna of *Sinoxylon ceratoniae* (Linnaeus); 10: Antenna of *S. senegalense* Karsch; 11: Head and Pronotum of *Acantholyctus cornifrons* (Lesne); 12: Intercoxalprocess of Xyloperthini; 13: Intercoxalprocess of Bostrichini. Figures 5–8, 11: modified after Lesne 1924; Figures 9, 10, 12, 13: ex Geisthardt & van Harten 1992.

- 6 Antennal segments three to six combined shorter than the half length of the first segment of the club (Fig. 5). Club very large, more than two times longer than segments 1–6 combined. (Antennae 9-segmented). Truncated posterior part of the elytra lateral with one spine only. 2.5–4.5 mm (Fig 1) *Enneadesmus forficula* Fairmaire
- Antennal segments three to six combined longer than the half length of the first segment of the club. Club smaller, less than two times longer than segments 1–6 combined. (Antennae 9-segmented). Truncated posterior part of the elytra lateral with a spine and a tubercle (Plate 7, Fig. 7). 3.5–5.0 mm *Enneadesmus obtusidentatus* (Lesne)



Plates 20–25. 20: *Bostrychoplites zickeli* (Marseul), pronotum; 21: *Phonapate uncinata uncinata* (Karsch), head and pronotum, female; 22: *Xylomedes rufocoronata* (Fairmaire), pronotum. 23: *Phonapate uncinata uncinata* (Karsch), abdomen, lateral; 24: *Sinoxylon pugnax* Lesne, apex of right elytron; 25: *Xylomedes rufocoronata* (Fairmaire), antenna.

- 7 Three-segmented antennal club more or less flabellate or nearly lamelliform 8
- Antennal club loose, neither flabellate nor lamelliform 11
- 8 Each elytron with an acute spine at the upper part of apical declivity 9
- There are no acute spines at the apical declivity, which is polished. 3.2–4.5 mm (Plate 6) *Calopertha truncatula* (Ancey)
- 9 Elytra without ridges 10
- Elytra with ridges that reach the apical declivity and are somewhat projected backwards, so that the truncated area seems to have more than two spines (Plate 24). 6.0–8.5 mm (Plates 12–13) *Sinoxylon pugnax* Lesne
- 10 Second segment of antennal club comparatively broad and shorter or as long as the first seven segments combined (Plate 14, Fig. 10). 5.0–9.0 mm *Sinoxylon senegalense* Karsch
- Second segment of antennal club narrow, longer than the first seven combined (Fig. 9). 3.5–5.5 mm (Plate 11, Fig. 3) *Sinoxylon ceratoniae* (Linnaeus)

- 11 Anterior margin of the prothorax always with two well developed 'horns', which are projected forward. Posterior part of the head more or less spherical 12
- Anterior margin of the prothorax only with short 'horns', which are more or less projected upwards. Posterior part of the head not spherical. 6.0–12 mm (Plates 4–5).....
..... *Bostrychopsis reichei* (Marseul)
- 12 Hind tarsi much longer than the tibiae. 7.0–9.0 mm (Plate 1).....
..... *Bostrychoplites normandi yemenensis* Lesne
- Hind tarsi as long as or shorter than the tibiae. 4.5–23 mm (Plates 2–3, 20).....
..... *Bostrychoplites zickeli* (Marseul)

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Order Coleoptera, family Cleridae

Roland Gerstmeier

INTRODUCTION

Members of the family Cleridae are broad to elongate, often brightly coloured and nearly always covered with erect hairs. The head and the eyes are usually plainly visible and more or less prominent. The antennae are variable in size and form, with 8 to 11 antennomeres, often clubbed, some serrate or pectinate. The structure of the pronotum offers characters useful for separating genera and species. The elytra are nearly always complete, rarely exposing two tergites, often with striae or punctuation, and usually with 10 rows. The legs are of normal length, sometimes the hindlegs are elongate.

Like many insect groups, Cleridae are most diverse in tropical and warm temperate areas, with the Afrotropics being the most species-rich zoogeographic region. Following the subfamily system of Lawrence & Newton Jr. (1995), the 3570 clerid species are distributed across 303 genera and 7 subfamilies (author's data bank).

With the exception of some central European and North American species, little is known about the reproduction, developmental stages, food or behaviour of clerids. Both larvae and adults of most species are supposed to be predators of other insects.

Little is known about the clerid fauna of Arabia. Winkler (1981) published a first paper, followed by a paper of Menier (1986) in the same journal. Gillett & Gillett (2009) recently published a paper on Cleridae of the UAE and North Oman, comprising five species. The data on distribution of Cleridae in the Arabian Peninsula as given in Table 1 are compiled from Gerstmeier (1998), Gillett & Gillett (2009), Menier (1986), Winkler (1981), and the author's collection. In total, 9 species are now reported for the UAE and 17 species for the whole Arabian Peninsula.

MATERIALS AND METHODS

This compilation is based on the examination of more than 800 specimens, all preserved in ethanol. Unless stated otherwise, all specimens dealt with were collected by Antonius van Harten. Some specimens (especially of the new species) have been pinned or glued and have been divided between the UAE Invertebrate Collection, the author's collection (Collection of Technische Universität München, Animal Ecology; deposited as permanent loan in R. Gerstmeier's collection, München, Germany = CRG), the collections of Jacques Rifkind, Valley Village, Justin S. Bartlett, Brisbane, Weston Opitz, Salinas, Ganyang Yang, Beijing, and Kaoru Sakai, Tokyo. The holotype of *Opilo desertorum* nov. spec. is deposited in the CRG, several paratypes in the Gillett collection, Birmingham, UK, and two paratypes at the Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany.

Regarding *Opilo desertorum* nov. spec., male genitalia were removed with fine forceps through small incisions made along the sides of the terminal abdominal segments. Aedeagi were macerated in 10% KOH, cleared in 70% ethyl alcohol and stored within glycerine in genital vials, which were pinned below each specimen. Measurements were made under a stereo microscope using an ocular micrometer. Total body length is the distance measured from the apical clypeal margin to the elytral apices. Length to width ratios were calculated from the longest and widest possible measurements of pronotum and elytra. Habitus photographs

Table 1: Distribution of species of Cleridae in the Arabian Peninsula.

	UAE	KSA	Oman	Yemen
<i>Cylidrus megacephalus</i> Spinola, 1844				x
<i>Diplocladus arabicus</i> Gerstmeier & Weiss, 2009		x		
<i>Eucymatodera senegalensis</i> Castelnau, 1832	x	x	x	x
<i>Teloclerus compressicornis</i> (Klug, 1842)	x	x		x
<i>Tillodenops bimaculatus</i> (Schenkling, 1899)	x	x		x
<i>Tillodenops plagiatus</i> (Fairmaire, 1892)	x	x	x	x
<i>Tilloidea notata</i> Klug, 1842	x			
<i>Wittmeridecus mediozonatus</i> (Fairmaire, 1892)	x	x	x	x
<i>Opilo desertorum</i> Gerstmeier nov. spec.	x	x	x	
<i>Opilo longipilis</i> Fairmaire, 1892		x		
<i>Phloiocopus arabicus</i> (Corporaal, 1941)				x
<i>Phloiocopus tricolor</i> Guérin-Méneville, 1844		x		x
<i>Sedlacekius pountianus</i> Menie, 1981				x
<i>Trichodes martini</i> Fairmaire, 1896				x
<i>Winklerius grandis</i> (Stierlin, 1868)		x		
<i>Necrobia rufipes</i> (deGeer, 1775)	x	x	x	
<i>Opetiopalpus</i> spec.	x			

UAE = United Arab Emirates; KSA = Kingdom of Saudi Arabia

of adult beetles were taken, as a series, using a DFC 490 digital camera fitted to a Leica Z6 stereo microscope, then composited with Leica LAS 3.2.0 automontage software.

Abbreviations used: LT = light trap; MT = Malaise trap; PT = pitfall trap; NARC = National Avian Research Centre.

SYSTEMATIC ACCOUNT

Subfamily **Tillinae** Leach, 1815

Eucymatodera senegalensis (Laporte, 1832)

Plate 1

Specimens examined: Al-Ajban, 10–17.x.2005, LT & MT; 17.x–9.xi.2005, LT; 22.x–9.xi.2005, MT; 5–12.vi.2006, MT; 9.iv–2.v.2006, MT; 25.vii–21.viii.2006, MT. SSW of ad-Dhaid, 24–30.v.2006, LT. Fujairah, 20–27.v.2006, LT. Sharjah Desert Park, 23–30.iv.2007, LT; 12–21.v.2007, LT. Sharjah-Khor Kalba, near tunnel, 24–30.v.2006, LT; 31.v–7.vi.2006, LT; 7–14.vi.2006, LT. NARC, near Sweihan, 30.iv–11.5.2005, LT. Wadi Bih dam, 21–30.iv.2006, LT; 30.iv–4.vi.2008, LT. Wadi Maidaq, 27.iv–4.v.2006, LT. Wadi Safad, 15–22.iv.2006, LT.

Diagnosis: Body length 7–13 mm. Antennae serrate from 5th segment onwards, terminal segment not much longer than 9th and 10th together; pronotum elongate; punctuation of elytra reaching the middle.

Distribution: Whole Sahara, Israel, Saudi Arabia, UAE, Oman, Yemen.



Plate 1. *Eucymatoderes senegalensis* (Laporte).

***Teloclerus compressicornis* Klug, 1842**

Specimens examined: Khor al-Khwair, 16–23.v.2007, LT.

Diagnosis: Body length 4.7–9.0 mm. Antennae serrate from 5th segment onwards, terminal segment of males distinctly longer than the rest of antennae, in females at least as long as the three preceding segments together.

Distribution: Whole Sahara (from Morocco to Somalia), UAE, Saudi Arabia, Yemen, southern Spain, southern Sardinia, Guinea, Nigeria, South Africa, Madagascar.

Plate 2

Plate 2. *Teloclerus compressicornis* Klug.***Tilloedenops bimaculatus* Schenkling, 1899**

Specimens examined: Al-Ajban, 10–17.x.2005, LT & MT; 17.x–9.xi.2005, LT; 26.ii–2.iv.2006, LT. Hatta, 19–28.iii.2006, LT; 17–24.viii.2006, LT. Khor al-Khwair, 15–22.iii.2007, LT; 2–13.v.2007, LT. Near Mahafiz, 25.iii.2006, at light, leg. A. van Harten & K. Szpila; 21–28.iii.2006, LT; 4–11.iv.2006, LT. Sharjah Desert Park, 22.ii–9.iii.2005; 9–21.iii.2005, 29.iii–6.iv.2005; 6–30.iv.2005; 30.iv–31.v.2005; 30.vi–21.vii.2005, 21.vii–5.viii.2005, 20.x–8.xi.2005; 13.xi–11.xii.2005; 25.ii–25.iii.2006; 17–24.iii.2007; 1–8.iv.2007; 15–22.iv.2007; 23–30.iv.2007; 12–21.v.2007; 8–15.vii.2007; 20.x–24.xi.2007; 14.ii–1.iv.2008; 1–6.iv.2008; 6–30.iv.2008; 30.iv–25.v.2008; 16.vi–15.vii.2008; 11.xii.2008–6.i.2009, all LT. Sharjah-Khor Kalba, near tunnel, 7–22.iii.2006, LT; 26.iv–3.v.2006, LT. NARC, near Sweihan, 14.iii–2.iv.2005; 2–30.iv.2005; 26.ii–2.iv.2006, all LT. Wadi Bih dam, 13–

Plate 3



Plate 3. *Tillodenops bimaculatus* Schenckling.

20.v.2008, LT; 24–29.vi.2008, LT. Wadi Safad, 21.ii–4.iii.2006, LT; 15–22.iv.2006, LT; 1–8.vii.2006, LT. Wadi Wurayah farm, 15.i–22.ii.2009, LT.

Diagnosis: Body length 2.7–7.0 mm. Clypeus large, sides not extended.

Distribution: Whole Sahara (Mauretania, Senegal, Algeria, Ennedi, Tibesti, Egypt, Sudan), Saudi Arabia, UAE, Yemen, India, Somalia, Kenya, Namibia, South Africa.

***Tillodenops plagiatus* Fairmaire, 1892**

Specimens examined: Al-Ajban, 9.xi–7.xii.2005, LT & MT; 21.viii–12.ix.2006, MT. Fujairah, 5.iii–6.iv.2005; 6.iv.–2.v.2005; all LT. Hatta, 8–26.iv.2006; 17–24.viii.2006, all LT. Khor al-Khwair, 3–10.iv.2007; 2–13.v.2007; all LT. Near Mahafiz, 23.iv.2005, at light, leg. A. van Harten & K. Szpila; 10–

Plate 4



Plate 4. *Tilloedenops plagiatus* Fairmaire.

29.xii.2005, LT; 2.ii–2.iii.2006, LT; 4–11.iv.2006, LT. Sharjah Desert Park, 9–21.iii.2005; 29.iii–6.iv.2005; 6–30.iv.2005; 30.iv–31.v.2005; 20.x–8.xi.2005; 25.ii–25.iii.2006; 17–24.iii.2007; 24.iii–1.iv.2007; 1–8.iv.2007; 15–22.iv.2007; 22–30.iv.2007; 5–12.v.2007; 12–21.v.2007; 8–15.vii.2007; 30.iv–25.v.2008; 11.xii.2008–6.i.2009; all LT. Sharjah-Khor Kalba, near tunnel, 16–31.i.2006; 7–22.iii.2006; 26.iv–3.v.2006; all LT. NARC, near Sweihan, 26.ii–2.iv.2006; 14.iii–2.iv.2005; 2–30.iv.2005; 28.xii.2005–22.i.2006; 30.i–26.ii.2006, all LT. Wadi Bih dam, 21–30.iv.2006; 15–22.iii.2007; 6–17.iii.2008; 30.iv–4.vi.2008; 13–20.v.2008; 9–18.vi.2008; 29.vi–8.vii.2008; 9–23.vii.2008; all LT. Wadi Maidaq, 27.iv–4.v.2006, LT. Wadi Safad, 14–21.v.2006; 31.i–21.ii.2006; 21.ii–4.iii.2006; 15–22.iv.2006; 24.vi–15.vii.2006; all LT. Wadi Wurayah farm, 22.ii–2.iii.2009, LT.



Plate 5. *Tilloidea notata* Klug.

Diagnosis: Body length 4.5–8mm. Clypeus large, extended cheek-like in front.

Distribution: Sahara (Mauretania, Ennedi), Senegal, Sudan, Somalia, Kenya, Tanzania, Iran, UAE, Oman, Saudi Arabia, Yemen.

***Tilloidea notata* Klug, 1842**

Specimens examined: Fujairah, 15–22.iv.2006; 20–27.v.2006; all LT.

Diagnosis: Body length 3.7–7.5 mm. Antennae serrate from 4th segment onwards, scutellum light red-brown.

Plate 5



Plate 6. *Wittmeridecus mediozonatus* Fairmaire.

Distribution: Distributed over much of the Oriental region, Japan, Iran, imported to Wales. New to the UAE and to the Arabian Peninsula.

***Wittmeridecus mediozonatus* Fairmaire, 1892**

Specimens examined: Fujairah, 20–27.v.2006, LT. Hatta, 8–26.iv.2006; 24–30.v.2006; 14–21.vi.2006; 17–24.viii.2006; all LT. Khor al-Khwair, 3–10.iv.2007; 2–13.v.2007; all LT. Near Mahafiz, 23.iv.2005, at light, leg. A. van Harten & K. Szpila. Sharjah Desert Park, 6–30.iv.2005; 30.iv–25.v.2008; all LT. Sharjah-Khor Kalba, near tunnel, 26.iv–3.v.2006; 24–30.v.2006; 7–14.vi.2006; all LT. NARC, near Sweihan, 2–30.iv.2005; 31.v–30.vi.2005; all LT. Wadi Bih dam, 30.v–5.vi.2007; 30.iv–4.vi.2008; 4–

Plate 6

9.vi.2008; 9–18.vi.2008; 24–29.vi.2008; 29.vi–8.vii.2008; 8–23.vii.2008; all LT. Wadi Midaq, 27.iv–4.v.2006; 1–8.vii.2006; all LT. Wadi Safad, 15–22.iv.2006; 14–21.v.2006, LT; 17–24.vi.2006; 24.vi–15.vii.2006; all LT.

Diagnosis: Body length 3.0–13.5 mm. Antennae serrate from 7th segment onwards, terminal segment of male nearly as long as the rest of antenna, in female as long as or a little longer than antennal segments 8–10.

Distribution: Probably whole Sahara, UAE, Saudi Arabia, Oman, Yemen.

Subfamily **Clerinae** Latreille, 1802

***Opilo desertorum* Gerstmeier nov. spec.**

Plate 7, Figures 1–6

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Midaq, 25°18'N 56°07'E, 2–16.ii.2006, light trap, leg. A. van Harten (CRG). Paratypes: 2 ex., al-Ain al-Faydah, 18.ix.2003, at light, leg. M.P.T. Gillett; 1 ex., Jebel Hafit, Wadi Tarabat, 17.x.2003, at light, leg. M.P.T. Gillett; 1 ex., 20.v.2004, at light, leg. M.P.T. Gillett; 1 ex., Khor al-Khwair, 2–13.v.2007, LT; 1 ex., Near Mahafiz, 27.xi–1.xii.2005, PT & WT; 1 ex., 10–29.xii.2005, LT; 4 ex., 21–28.iii.2006, LT; 2 ex., 25.iii.2006, at light; 2 ex., 7–14.ix.2006, LT; 2 ex., Sharjah Desert Park, 29.iii–6.iv.2005; 1 ex., 6–30.iv.2005; 1 ex., 25.ii–25.iii.2006; 1 ex., 17–24.iii.2007; 1 ex., 1–8.iv.2007; all LT. 12 ex., Sharjah-Khor Kalba, near tunnel, 16–31.i.2006; 4 ex., 7–22.iii.2006; all LT. 2 ex., Wadi Bih dam, 6–17.iii.2008; 1 ex., 15–22.iii.2007; 4 ex., 21–30.iv.2008; 1 ex., 13–20.v.2008, all LT. 3 ex., Wadi Safad, 20.xii.2005–2.i.2006; 1 ex., 2–26.i.2006; 3 ex., 31.i–21.ii.2006; 6 ex., 21.ii–4.iii.2006; 1 ex., 24.vi–15.vii.2006, all LT. OMAN: 2 ex., ad-Dhahirah, Kahl Area, 20.xi.2004, at light, leg. M.P.T. Gillett; 3 ex., ad-Dhahirah, Jazeerah, 23.x.2004, at light, leg. M.P.T. Gillett; 1 ex., Mahdah, Tawi, 14.xi.2004, at light, leg. M.P.T. Gillett.

Description: Length 7.5–12.8 mm. Head, pronotum and legs dark brown, elytra brown; vested with long, erect, light setae.

Head. Head including eyes broader than anterior width of pronotum, eyes large, protruding laterally, coarsely faceted, conspicuously margined, separated by approximately a single eye width; surface glossy, with a conspicuous, irregular rugosity; labrum and clypeus yellow-brown, labrum broadly V-shaped, terminal maxillary and labial palpomeres triangular; gular process broad; antennae short, not reaching base of pronotum when straightened backwards, brown, becoming paler distally, apical half of antennomere 11 light yellow-brown.

Prothorax. Only slightly longer than broad, length:width ratio 1.1:1, lateral margins slightly sinuate, more constricted posteriorly, broadest behind middle; surface anterior to subapical transverse depression glossy, with large, but not deep punctures; surface posterior to subapical depression less glossy, darker, conspicuously and irregularly rugose; central part of pronotal base smooth in longitudinal direction (this looks like a ‘carina’, but is not impressed nor carinated); procoxal cavities open behind, prointercoxal process expanded.

Mesothorax. Dark brown to black, anterior mesosternal process present, forming a triangular bulge, deeply emarginate on each side; scutellum transverse/elliptic.

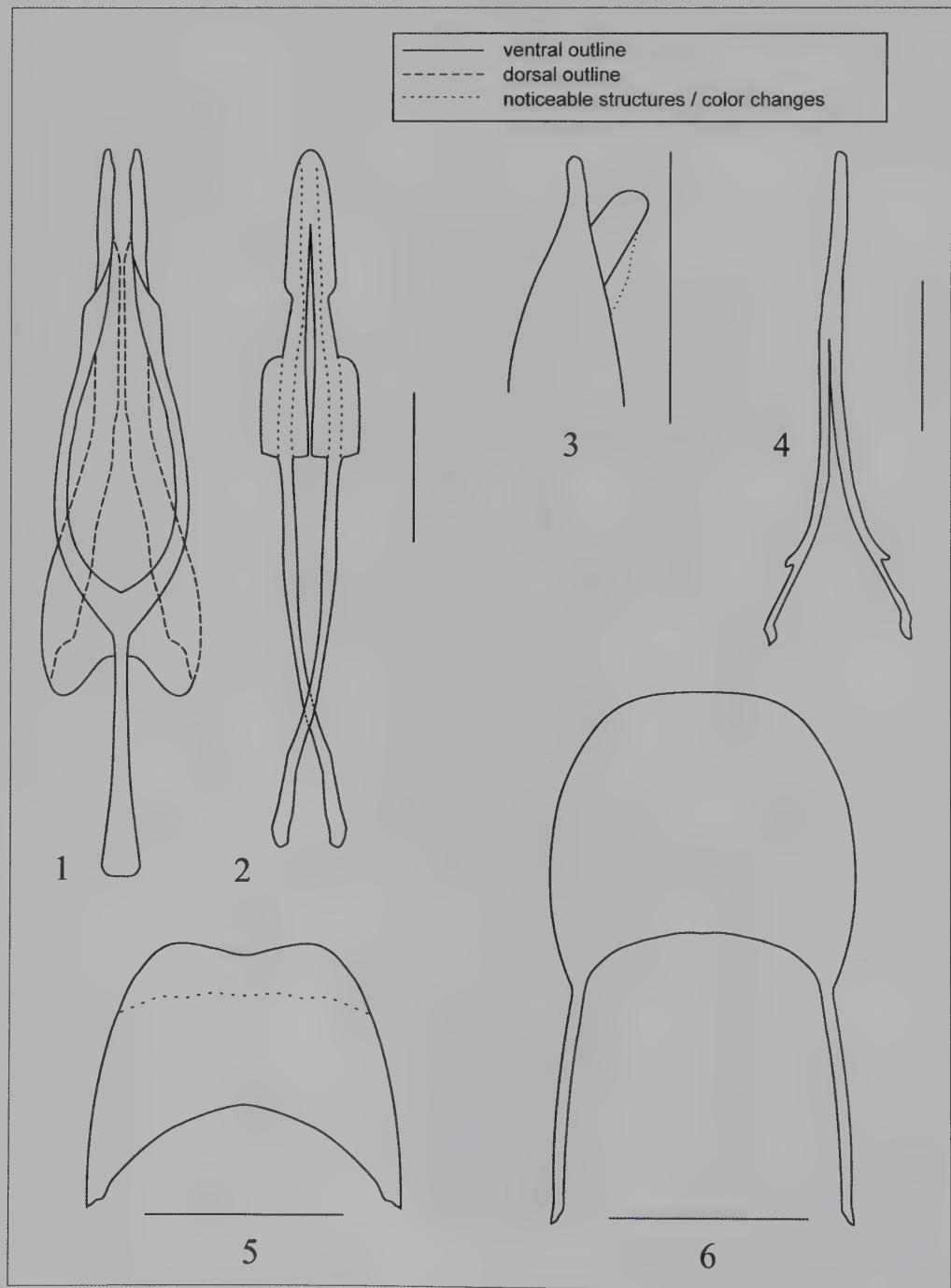
Metathorax. Dark brown to black brown, posterioly with two short, protruding lumps.

Abdomen: Light brown to yellow-brown.

Elytra. Brown, glossy, narrow, long, length:width ratio 2.6:1, slightly dilated posteriorly, base not margined; sutural angle dehiscent, each elytron acute to right-angled; posterior third of each elytron with a black, elongate macula besides suture, not reaching the suture and well separated from apex; the disc frequently with a pale transverse macula without acute boundary; punctuation coarse, deep and irregular; from base to apex diameter of punctures gradually increasing in size, from as wide as interstices to more than twice diameter of interstices, without microsculpture.



Plate 7. *Opilo desertorum* Gerstmeier nov. spec.



Figures 1–6. *Opilo desertorum* nov. spec., morphological organs. 1: Tegmen, ventral view; 2: Phallus, ventral view; 3: Tip of aedeagus, lateral view; 4: Spicular fork; 5: Abdominal ventrite VI; 6: Pygidium. Scale 500 μm .

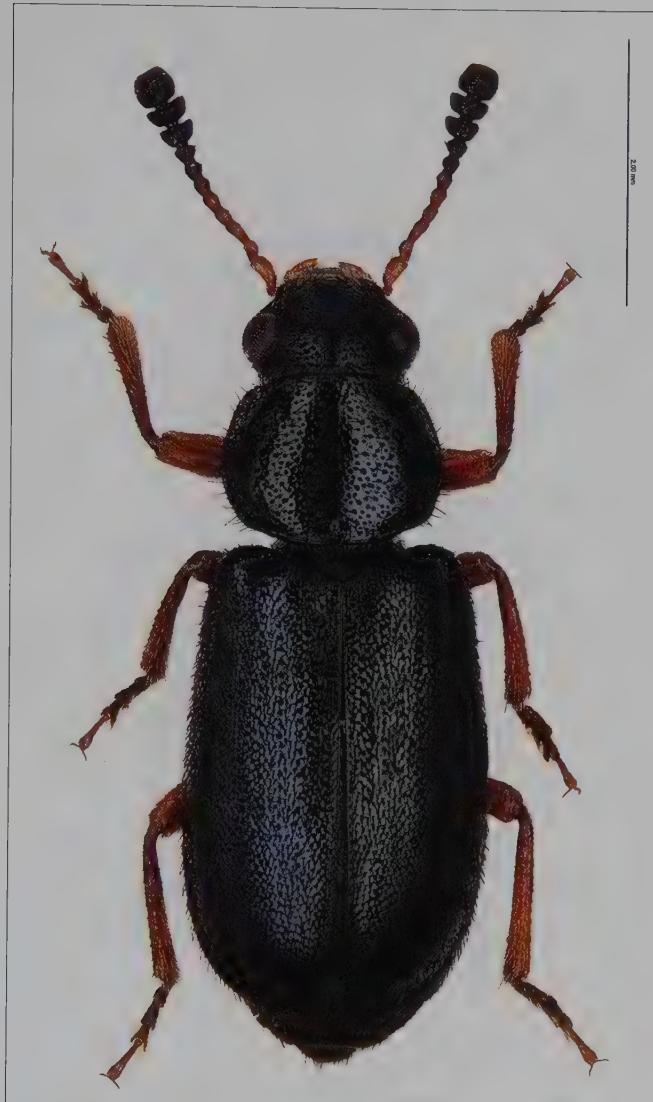


Plate 8. *Necrobia rufipes* DeGeer.

Legs. Short, compact, femora (especially front femora) conspicuously dilated distally, tibiae with longitudinal carinae, front tibiae curved inwards distally, middle tibiae slightly curved distally, hind tibiae almost straight; tarsal pulvillar formula 3-3-3, tibial spur formula 1-2-2, spurs short.

Morphological organs. Aedeagus, spicular fork, terminal ventrite and pygidium, see Figures 1-6. Differential diagnosis: *Opilo desertorum* nov. spec. can be easily separated from all other Arabian *Opilo* species (including *Winklerius grandis* (Stierlin, 1868)) by its uniform elytral colour and the irregular punctuation of the elytra.

Distribution: UAE, Oman.



Plate 9. *Opetiopalpus* spec.

Subfamily **Korynetinae** Laporte, 1838

Necrobia rufipes DeGeer, 1775

Specimens examined: Al-Ajban, 17.x–9.xi.2005; 9.xi–7.xii.2005; 5–12.vi.2006, all LT. Hatta, 24–30.v.2006, LT. Khor al-Khwair, 2–13.v.2007; 3–10.iv.2007; all LT. Sharjah, 25–27.iv.2006, LT, leg. C. Gielis. Sharjah Desert Park, 18–25.i.2005; 9–21.iii.2005; 29.iii–6.iv.2005; 6–30.iv.2005; 30.iv–31.v.2005; 31.v–30.vi.2005; 21.vii–5.viii.2005; 20.x–8.xi.2005; 5–12.v.2007; 1–6.iv.2008; all LT. Sharjah-Khor Kalba, near tunnel, 24–30.v.2006; 30.v–7.vi.2006; all LT. NARC, near Sweihan, 14.iii–2.iv.2005; 2–30.iv.2005; all LT. Wadi Bih dam, 13–20.v.2008, LT. Wadi Maidaq, 2–16.ii.2006, LT. Wadi Safad, 21.ii–4.iii.2006, LT.

Plate 8

Diagnosis: Body length 3.2–6 mm. Surface unicolourous, metallic blue, blue-green to blue-black, legs and 5–6 basal antennal segments reddish yellow.

Distribution: Cosmopolitan; UAE, Saudi Arabia, Oman.

***Opetiopalpus* spec.**

Plate 9

Specimens examined: Al-Ajban, 1 ex., 6–22.v.2006, LT.

Diagnosis: Body length 3.3 mm. This genus is in need of revision before we can reliably determine the species.

Distribution: First record of the genus for the UAE.

ACKNOWLEDGEMENTS

My sincere thanks go to Antonius van Harten, who made available all these interesting specimens from extensive collections in UAE. My wife Marianne Müller helped with the processing of the colour photographs. Special thanks go to Conrad P.D.T. Gillett, for revising the manuscript, and his father, Michael P.T. Gillett for the loan of specimens of *Opilo desertorum* nov. spec.

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Order Coleoptera, family Laemophloeidae

Michael C. Thomas

INTRODUCTION

The Laemophloeidae is a small family of fewer than 450 species distributed worldwide but most abundant in tropical regions. Most are found under the bark of dead trees where they seem to feed primarily on ascomycete fungi. A few are stored grain pests with worldwide distributions. Only two publications have dealt with the laemophloeid fauna of the Arabian Peninsula (Lefkovitch, 1965; Slipinski, 1984), in which 11 species were recorded but none from the United Arab Emirates. The Arabian laemophloeid fauna primarily is composed of cosmopolitan species and species shared with Africa (Lefkovitch, 1965; Slipinski, 1984):

- Cryptolestes pusillus* (Schönherr, 1817): Saudi Arabia (Lefkovitch, 1965)
Cryptolestes ferrugineus (Stephens, 1831): Saudi Arabia (Lefkovitch, 1965; Slipinski, 1984)
Cryptolestes klapperichi Lefkovitch, 1962: Yemen (Lefkovitch, 1965)
Cryptolestes candius Lefkovitch, 1965: Yemen (Lefkovitch, 1965)
Cryptolestes curus Lefkovitch, 1965: Yemen (Lefkovitch, 1965)
Cryptolestes biskrensis (Grouvelle, 1899): Saudi Arabia (Slipinski, 1984)
Leptophloeus linearis (Grouvelle, 1908): Yemen (Lefkovitch, 1965)
Placonotus politissimus (Wollaston, 1867): Yemen (Lefkovitch, 1965)
Placonotus africanus Lefkovitch, 1962: Yemen (Lefkovitch, 1965)
Placonotus majus Lefkovitch, 1963: Saudi Arabia (Slipinski, 1984)
Placonotus saudicus Slipinski, 1984: Saudi Arabia (Slipinski, 1984)

In this paper *Acompsophloeus arabicus* Thomas nov. gen., nov. spec., is described and illustrated from the United Arab Emirates. Five other species of Laemophloeidae are recorded for the first time from the UAE.

MATERIALS AND METHODS

The habitus photograph was taken with a Syncroscopy AutoMontage® system through a Leica Z16 APO microscope; genitalic and mouthpart photographs were taken using a Zeiss Photo-Microscope III adapted to use a Nikon Coolpix 8400 digital camera; scanning electron photomicrographs were produced with a JEOL JSM-5510LV. Genitalia were dissected as described in Thomas (1984a) and were embedded in a drop of dimethyl hydantoin formaldehyde on the card point with the respective specimen.

All specimens dealt with were collected in light traps by A. van Harten. When not otherwise indicated, the specimens have been divided between the FSCA and the UAEIC.

Abbreviations for collections mentioned in the text are:

- BMNH Natural History Museum, London, England
FSCA Florida State Collection of Arthropods, Gainesville, FL, USA
MZW Polish Academy of Science, Museum of the Institute of Zoology, Warsaw, Poland
UAEIC United Arab Emirates Invertebrate Collection
USNM National Museum of Natural History, Washington, D.C., USA



Plate 1. *Acompsophloeus arabicus* Thomas nov. spec., dorsal habitus.

SYSTEMATIC ACCOUNT

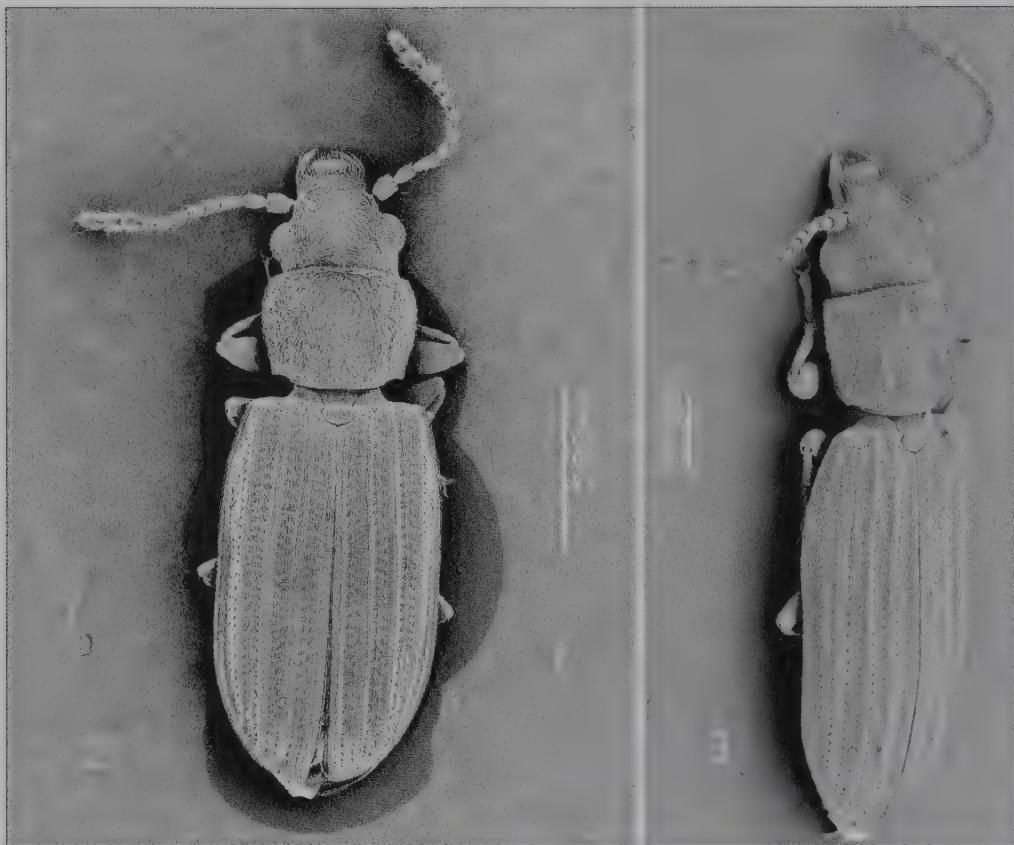
Acompsophloeus Thomas nov. gen.

Type-species: *Acompsophloeus arabicus* Thomas nov. spec., by present designation.

Diagnosis: The combination of the following character states are diagnostic for this genus: Extremely coarsely sculptured head and pronotum, and concomitant near obliteration of the sublateral lines; narrowly open procoxal cavities; 5-5-5 tarsal formula in both sexes; short, clubbed antennae; and lack of parameres in the male.

Description: With characters of Laemophloeidae (Thomas, 2002). Size small. Form, elongate oval, dorsoventrally compressed.

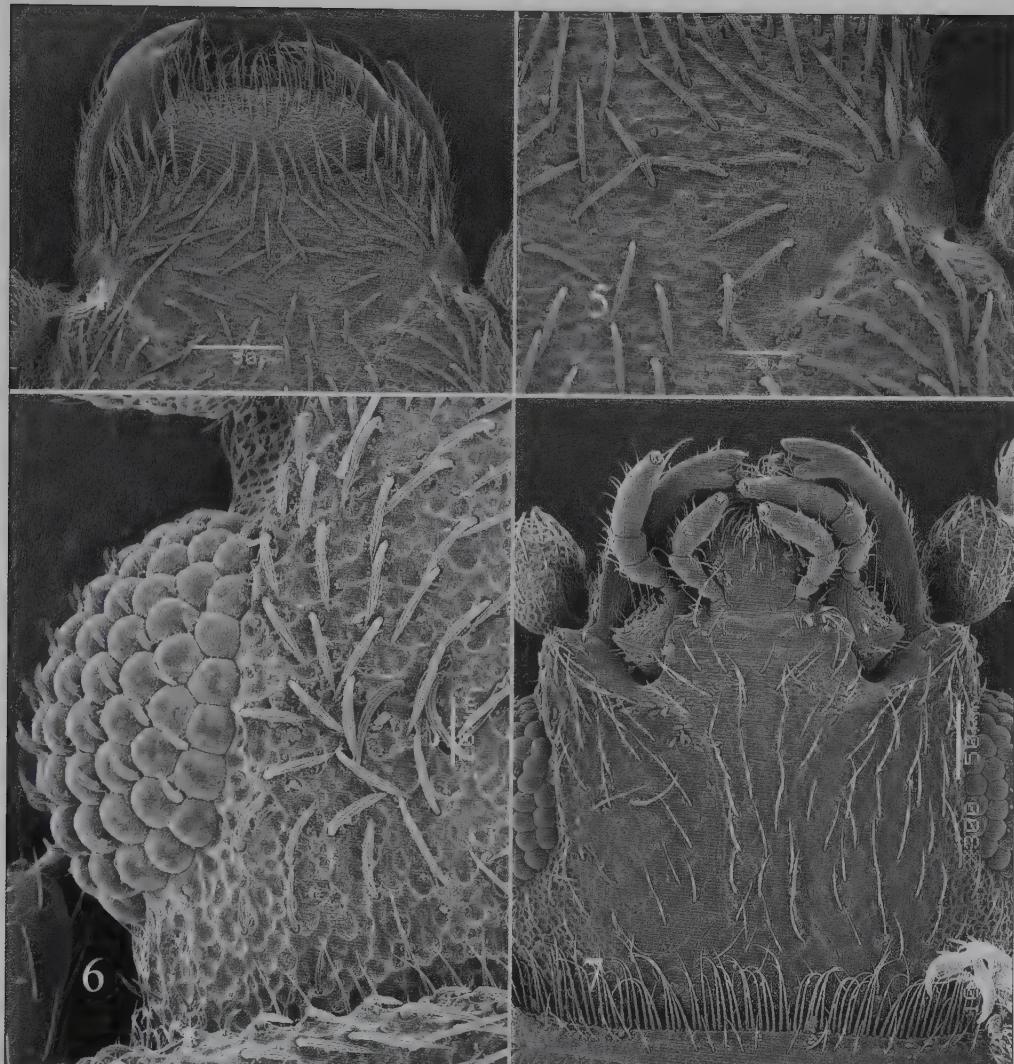
Head. Transverse, prolonged in front of eyes. Eyes large, hemispherical; interfacetal setae coarse, conspicuous (Plate 6). Clypeus shallowly emarginate with weak emargination (Plate 4), continuing onto surface of frons as a short, obliquely; frons above antennal insertions



Plates 2-3. *Acompsophloeus arabicus* Thomas nov. spec. 2: Dorsal habitus; 3: Oblique view showing pronotal impressions.

depressed area (Plate 5). Surface sculpture extremely rough, obliterating sublateral lines, and overlaid with small, deep punctures each subtending a thick, grooved, reclinate seta (Plate 6). Antennae short, barely attaining base of elytra, filiform; scape large, robust; pedicel narrower than scape, about same length; antennomere III elongate, slender, 1.3 \times longer than scape; antennomeres IV-VIII subequal in length, longer than broad, each a little longer than 0.50 length of III, IX-XI enlarged to form a weak club (Plates 1-3). Labrum rounded anteriorly; mandible slender, with a large, membranous prostheca (Plate 12); palps slender (Plate 7).

Thorax. Pronotum (Plate 8) transverse, surface sculpture and pubescence as on head but sculpture even coarser; sublateral line almost obliterated by sculpture, represented by a shallow groove best observed with oblique lighting (Plate 9); paired discal impressions at base, within impressions surface sculpture anastomoses to form large, shallow, irregular excavations (Plates 3, 8, 9); less distinct impressions anteriorly. Prosternum with intercoxal process shallowly emarginate apically; coxal cavities narrowly open posteriorly (Plate 13). Elytra with three well-marked cells (Plate 10), edges of cells costate, each costa with a single row of setae; each cell with two rows of punctures between which are two rows of smaller punctures each subtending a thick seta (Plate 11); epipleura moderately broad, complete to

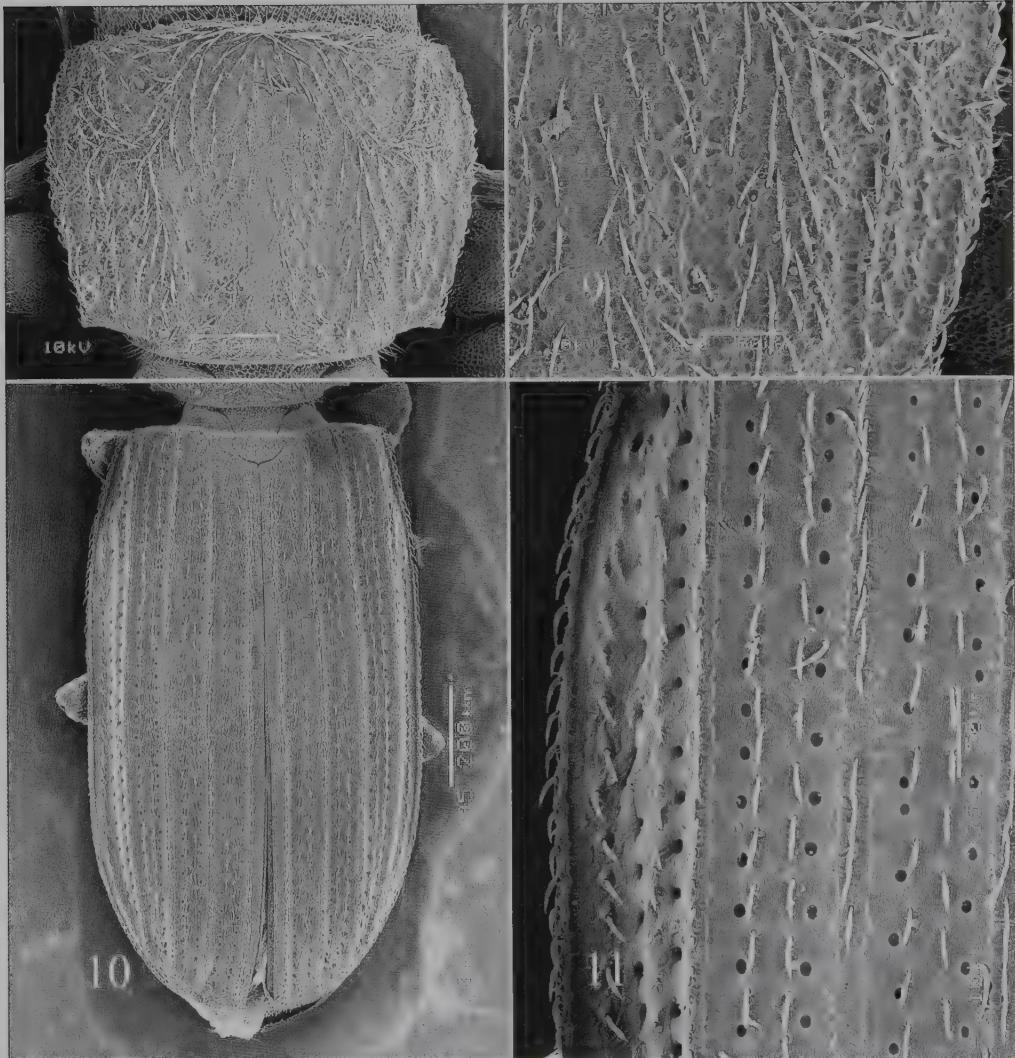


Plates 4–7. *Acompsophloeus arabicus* Thomas nov. spec. 4: Front of head; 5: Detail of front of head showing oblique impressions; 6: Eye and part of head, showing setae and surface sculpture; 7: Head, ventral view.

apex. Mesocoxal cavity closed by the mesosternum and mesepimeron, mesepisternum does not attain mesocoxal cavity (Plate 13); meso-metasternal junction straight, descrimen does not attain anterior margin of metasternum. Legs rather slender; tibial spurs small; subequal; tarsal formula 5-5-5 in both sexes.

Abdomen. Intercoxal process broadly rounded. Male genitalia with aedeagus simple, internal sac with complex armature; tegmen with basal piece well-developed, parameres reduced and fused to basal piece (Plate 14).

Etymology: From the Greek *akompsos*, meaning rude or boorish, referring to the rough sculpture, and *phloios*, meaning bark, a traditional root word in this family.



Plates 8–11. *Acompsophloeus arabicus* Thomas nov. spec. 8: Pronotum; 9: Detail of pronotum, showing surface sculpture and sublateral line; 10: Elytra; 11: Detail of elytra, showing punctuation within elytral cell.

***Acompsophloeus arabicus* Thomas nov. spec.**

Specimens examined: Holotype, male, with label data: "UNITED ARAB EMIRATES Wadi Maidaq 27.04–04.05.2006 light traps UAE 6713 coll. A. van Harten", 25°19'N 56°08'E, in FSCA. Paratypes: 1 ex., Bithnah, 31.xii.2005–2.ii.2006. 4 ex., Fujairah, 13–29.xi.2005. 4 ex., Hatta, 19–28.iii.2006. 35 ex., Sharjah-Khor Kalba, near tunnel, 7–22.iii.2006. 10 ex., Wadi Maidaq, 29.xi–22.xii.2005; 10 ex., 2–16.ii.2006; 1 ex., 27.iv–4.v.2006. 2 ex., Wadi Safad, 20.12.2005–2.i.2006.

Paratypes are deposited in BMNH, FSCA, UAEIC, USNM. In addition to the paratypes, I have examined one specimen from Saudi Arabia ("Jeddah 27-10-1976 Saudi Arabia W. Buttiker") (MZPW).

Plates 1–14



Plates 12–14. *Acompsophloeus arabicus* Thomas nov. spec. 12: Mandible; 13: Male genitalia; 14: Procoxal and mesocoxal cavities.

Diagnosis: The generic diagnosis is sufficient to distinguish this species.

Description: Body elongate oval, dorsoventrally compressed, 1.9 mm long; testaceous.

Head. Transverse, 1.5× wider than long measured across eyes; prolonged in front of eyes, distance from anterior edge of clypeus to anterior edge of eyes about 0.34 of total length of head. Eyes large, hemispherical, length equal to about 0.30× length of head; interfacetal setae coarse, conspicuous (Plate 6). Antennae short, barely attaining base of elytra, filiform; scape large, robust; pedicel narrower than scape, about same length; antennomere III elongate, slender, 1.3× longer than scape; antennomeres IV–VIII subequal in length, longer than broad, each a little longer than 0.50 length of III, IX–XI enlarged to form a weak club (Plate 1); ratios of antennomere lengths: 2.0:1.5:2.5:1.0:1.0:1.0:1.0:2.0:2.0:2.0.

Thorax. Pronotum (Plate 8) transverse, 1.3× wider than long; widest at about apical third, moderately constricted basally; anterior angles rounded, posterior angles obtuse, lateral margins minutely serrulate. Elytra 1.7× longer than combined width.

Abdomen. Ratios of lengths of abdominal segments III–VII measured at midline: 2.4:1.4:1.4:1.4:1.0.

Variation: Paratypes ranged in length from 1.4–2.0 mm. Otherwise, there is little variation. There are no conspicuous differences between the sexes.

Discussion: *Acompsophloeus arabicus* seems to be close to *Lathropus* Erichson, 1845, sharing with members of that genus the distinctive sculpturing including the near obliteration of the sublateral lines, modified dorsal setae, broadly rounded intercoxal process of sternum III, and mandibles with large membranous prostheca. The male genitalia are similar but the parameres in *Lathropus* are clearly not fused with the basal piece. Additionally, *Lathropus* differs in possessing completely closed front coxal cavities, mesocoxal cavities closed by the sterna, shorter antennae, and a broader body form. *Lepidophloeus* Thomas, 1984, also has similar sculpture and setae, and parameres that seem to be fused to the basal piece (Thomas,



15

16



17

18

Plates 15–18. 15: *Cryptolestes curus* Lefkovitch; 16: *Cryptolestes ferrugineus* (Stephens); 17: *Placonotus majus* Lefkovitch; 18: *Microbrontes* spec.

1984), but has extremely elongate antennae. *Rhabdophloeus* Sharp, 1899, has similar sculpture but differs in many ways from *Acompsophloeus* and *Lathropus*.

In Lefkovitch's 1962 key to laemophloeid genera of Africa, *Acompsophloeus* only goes to couplet 4, where it agrees with neither choice.

Distribution: Found in the UAE and in Saudi Arabia.

Cryptolestes curus Lefkovitch, 1965

Plate 15

Specimens examined: Al-Ajban, 8 ex., 10–17.x.2005; 3 ex., 17.x–9.xi.2005. Sharjah Desert Park, 3 ex., 21.vii–5.viii.2005; 2 ex., 31.v–30.vi.2005. Wadi Safad, 2 ex., 17–24.vi.2006.

Distribution: Described from Yemen, but recently spread as predator of red date-palm scale (*Phoenicoccus marlatti* Cockerell, 1899). Now known from California, Florida and Spain (Thomas, 2002). New to the UAE.

Cryptolestes ferrugineus (Stephens, 1831)

Plate 16

Specimens examined: Al-Ajban, 5 ex., 9.xi–7.xii.2005; 1 ex., 17.x–9.xi.2005. Bithnah, 2 ex., 31.xii.2005–2.i.2006. Fujairah, 6 ex., 6.iv–2.v.2005. Sharjah, 4 ex., 24.ix–9.x.2005. Sharjah Desert Park, 5 ex., 31.v–30.vi.2005; 4 ex., 2–30.i.2006; 7 ex., 6–30.iv.2006. Sharjah-Khor Kalba, near tunnel, 2 ex., 7–22.iii.2006. NARC, near Sweihan, 2 ex., 28.xii.2005–22.i.2006. Wadi Maidaq 6 ex., 29.xi–22.xii.2005; 2 ex., 27.iv–4.v.2006.

Distribution: Cosmopolitan, in stored products. Known from Saudi Arabia. New to the UAE.

Placonotus majus Lefkovitch, 1963

Plate 17

Specimens examined: Al-Ajban, 4 ex., 17.x–9.xi.2005; 5 ex., 9.xi–7.xii.2005. Bithnah, 1 ex., 31.xii.2005–2.i.2006. Fujairah, 1 ex., 6.iv–2.v.2005; 1 ex., 13–29.xi.2005. Hatta, 3 ex., 19–28.iii.2006. Sharjah, 4 ex., 24.ix–9.x.2005. Wadi Maidaq, 1 ex., 27.iv–4.v.2006; 1 ex., 2–16.ii.2006.

Distribution: Sub-Saharan Africa, West Indies (many islands), Colombia, Saudi Arabia. New to the UAE.

***Microbrontes* spec.**

Plate 18

Specimens examined: Sharjah Desert Park, 1 ex., 6–30.iv.2005.

Remarks: The genus *Microbrontes* Reitter, 1874, is known from Japan, Australia and New Zealand. It has not before been recorded from the Arabian Peninsula.

***Passandrophloeus* spec.**

Plate 19

Specimens examined: Sharjah, 2 ex., 24.ix–9.x.2005.

Remarks: The genus *Passandrophloeus* Kessel, 1921, is known from Africa and Asia. It has not before been recorded from the Arabian Peninsula.

ACKNOWLEDGEMENTS

I thank Antonius van Harten for making this very interesting material available for study. This is Entomology Contribution No. 1139 of the Bureau of Entomology, Nematology, and Plant Pathology, Division of Plant Industry, Florida Department of Agriculture and Consumer Services.

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Plate 19. *Passandrophloeus* spec.

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Order Coleoptera, family Phalacridae

Zdeněk Švec

INTRODUCTION

The family Phalacridae, commonly also called ‘shining flower beetles’ or ‘shining mould beetles’, comprises 52 genera with approximately 650 species from all over the world. In the Palaearctic the family is represented by 16 genera with 158 species (Švec, 2007).

The biology of the members of the family is insufficiently known. Since a long time it is known that adults and larvae of some Phalacridae (genus *Olibrus* Erichson, 1948) feed on composite flowers, others (genus *Phalacrus* Paykull, 1800) on wheat rusts, and some phalacrids seem to be predators (genus *Acylomus* Sharp, 1888); the biology of the rest of phalacrids is unknown.

No phalacrid beetles have been recorded from the UAE up to now, so the species collected recently by Antonius van Harten is new to the country. Being poorly known, the species is redescribed in the paper.

MATERIALS AND METHODS

Part of the specimens examined, especially the type specimens mentioned in this paper, belongs to the Museum d’Histoire Naturelle, Paris. The recent material from the UAE has been collected by A. van Harten and it is divided between the United Arab Emirates Invertebrate Collection and the author’s collection.

The genitalia have been removed from the specimens, dissected in a drop of water, rinsed and finally mounted in the Gum Arabic.

The measurements of total body length were taken from all specimens examined. Specific measurements of the individual body parts were taken from the lectotype only. They were measured to the first decimal place of millimetre. The redescription is based on the lectotype. Variability is mentioned in the paragraph “Variation” and includes features exhibited by other material examined.

Abbreviations used in the paper: LT = light trap; MT = Malaise trap; WT = water trap; NARC = National Avian Research Centre.

SYSTEMATIC ACCOUNT

Olibrosoma testacea Tournier, 1889

Plate 1, Figures 1–4

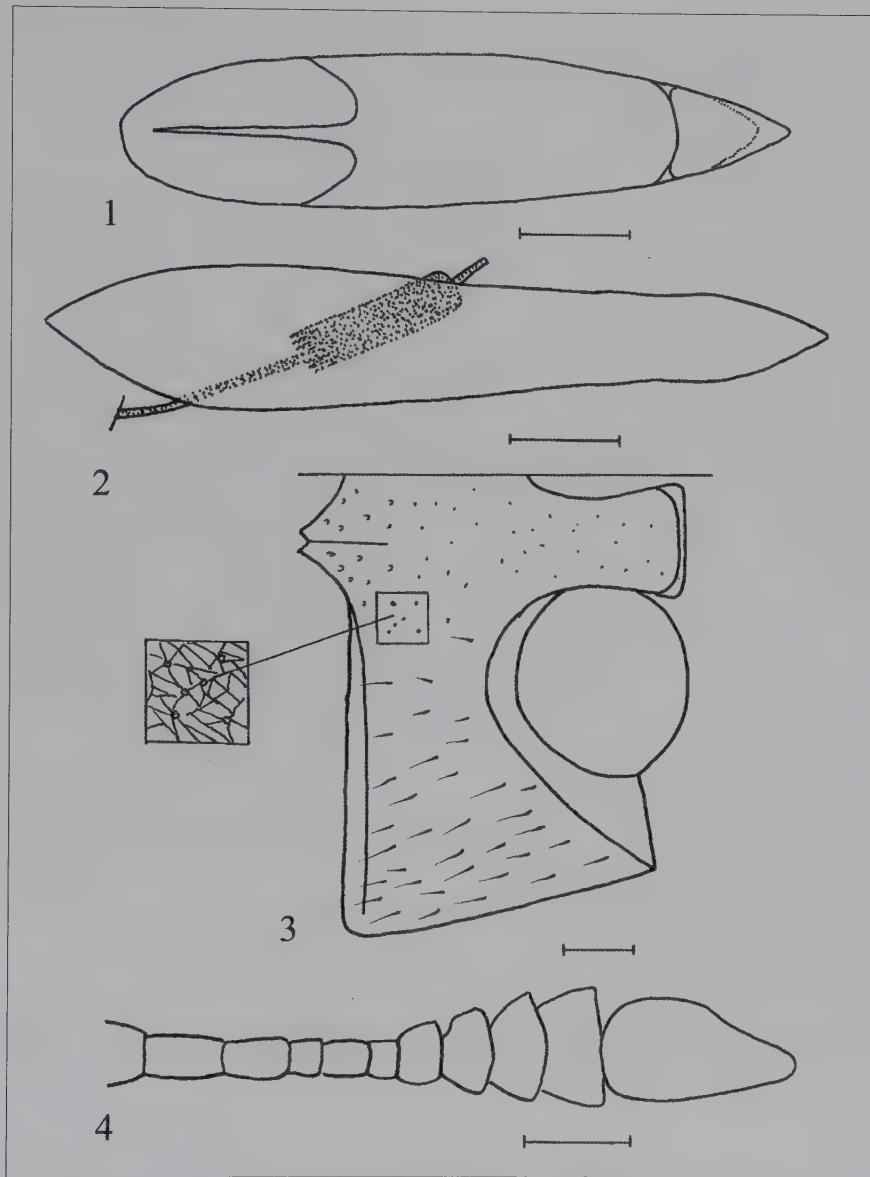
Specimens examined: Type material: ♂, lectotype (hereby designated in order to fix the type and to prevent doubts about the identity of the species), “Egypte; *Olibrosoma testacea* Trn; Type; Peyer. vidi; Type; Muséum Paris, Coll. M. Pic, Tournier”; added (by the author of this paper) a red label with text as follows: “Lectotypus, *Olibrosoma testacea* Tournier, 1889, Z. Švec des. 1999”. The lectotype is deposited in MHNP. Further material examined: 2 ex., “Egypte, genre *Litochroides* Guill., probable; Muséum Paris, coll M. Pic ex Tournier”, MHNP; 1 ex., “Jala’ at el Agabah, *Litochroides sharpi*=*Olibrosoma* probab., ex Peyerimhoff, Muséum Paris, coll. M. Pic ex Tournier, MHNP. Specimens from the UAE: Al-Ajban, 1 ex., 27.v–26.vi.2006, MT; 1 ex., 28.xii.2005–29.i.2006, MT & LT. Bithnah, 1 ex., 2.ii–2.iii.2006, LT; 2 ex., 4–26.iii. 2006, LT. Hatta, 1 ex., 24–30.iii.2006, LT. Near Mahafiz, 8 ex., 29.xii.2005–7.ii.2006, LT; 2 ex., 21–28.iii.2006, LT; 14 ex., 2.ii–2.iii.2006, LT; 4 ex., 2–14.viii.2006, LT; 8 ex., 24–30.v.2006, LT. Sharjah Desert Park, 7 ex., 14.x.2004, at light; 6 ex., 9–21.iii.2005, LT; 2 ex., 11.xii.2005–18.i.2006, LT; 6 ex., 2–30.i. 2006, LT; 10 ex., 3–10.iii.2007, LT; 1



Plate 1. *Olibrosoma testacea* Tournier. Habitus, dorsally.

ex., 10–17.iii. 2007, LT; 3 ex., 17–24.iii. 2007, LT; 12 ex., 15–22.iv. 2007, LT; 4 ex., 23–30.iv. 2007, LT; 7 ex., 5–12.v. 2007, LT; 2 ex., 28.v–4.vi. 2007, LT; 2 ex., 20.x–24.xi. 2007, LT; 1 ex., 24.xii. 2007, LT; 15 ex., 1–6.iv. 2008, LT; 5 ex., 30.iv–25.v. 2008, LT; 8 ex., 25.v–16.vi. 2008, LT; 3 ex., 9.viii–6.ix. 2008, LT; 1 ex., 31.i–12.ii. 2009, LT.. Sharjah-Khor Kalba, near tunnel, 1 ex., 31.v–7.vi. 2006, LT. NARC, near Sweihan, 1 ex., 28.xii. 2005–22.i. 2006, LT. Wadi Shawkah, 1 ex., 31.viii–11.ix. 2008, WT. Wadi Wurayah, 1 ex., 10–26.xii. 2006, WT.

Redescription: Oblong oval, length 2.4–3.8 mm, in lectotype 2.6 mm, head 0.1 mm, pronotum 0.6 mm, elytra 1.9 mm, maximum width of head 0.8 mm, pronotum 1.4 mm at base, elytra 1.4 mm at anterior third of their length. Dark yellowish, suture, pronotal base and scutellar margins darker; venter red-yellow, margins of metasternum darkened. Head. Antero-lateral margin emarginate just above articulation of antennae, clypeus flatly rounded. Distinctly



Figures 1–4. *Olibrosoma testacea* Tournier. 1: Tegmen dorsally; 2: Median lobe dorsally; 3: Mestasternum; 4: Antenna. Scale in Figures = 0.1 mm.

densely punctured, punctures separated by about 2 times their own diameter. Antenna with 5 segmented club (Fig. 4). Antennomeres 8–10 somewhat asymmetric widened medially. Ratios of length of antennomeres 2–11 (2nd antennomere equal to 1.0): 1.0–0.8–0.5–0.6–0.4–0.5–0.7–0.7–0.8–2.4. Ratios of width of antennomeres 2–11 (2nd antennomere equal to 1.0): 1.0–0.8–0.8–0.6–0.6–1.0–1.4–1.6–2.0–1.8. Pronotum. Hind angles acute shortly rounded on tip in dorsal view. Lobe-shaped base protracted caudally in front of scutellum. Punctured; punctures

separated by about 2–3 times their own diameter. Larger punctures sporadically disseminated along anterior margin and basis as well. Scutellum. Triangular, transversally microsculptured; with several punctures. Elytra. Extremely finely transversally strigose, densely finely punctured by transverse punctures bearing short fine central seta therefore punctures resemble laying letter E. Punctures confluent with lateral neighbours forming transverse wrinkles in some places, mainly laterally. Suture bordered; border terminates close to scutellum, not merging scutellar stria. Only sutural stria developed terminating approximately at the anterior third of elytral length. Prosternum. Prosternal process edged caudally bearing several very short setae. Mesosternum. Excavate anteriorly; very narrowly bordering metasternal process posteriorly. Metasternum as in Figure 3. Metathoracic wing. Fully developed. Abdomen. Oliquely microsculptured, sparsely setose, posterior margin of ventrites (except last visible ventrite) equipped by row of very long, stiff recumbent setae reaching mid-length of next ventrite. Legs. Anterior tibiae straight, with row of clamped setae laterally; anterior tarsomeres 1–3 widened. Mid-tibiae simply very feebly curved, with 2 almost equally long spines distally confined half of length of tarsomere 1. First tarsomere longer than others. Posterior tibiae straight laterally, concave medially obliquely truncate with two unequal spines at apex; longer spine not confined mid-length of 1st tarsomere. First tarsomere of posterior legs approximately as long as the rest of tarsus (without claws). Genitalia. Male genitalia are sclerotised enough showing significant characters (Figs 1, 2); female genitalia are membranous. Variation. Width of club antennomeres varies; therefore antennal club seem to be only 4 segmented in some specimens. Also the colour of the dorsum varies from yellowish up to yellowish chestnut specimens with darker head and pronotum. On elytra in majority of the specimens examined with developed sometimes paired striae forming shallow wide grooves possessing larger punctures than those in interstices. Anterior half of elytra with microsculpture forming by transverse cells in some specimens; the microsculpture changing in the simple transverse strigosity caudally.

Remarks: This species is known under a series of synonyms, viz. *Olibrosoma testacea* Tounier, 1889; *Helectrus brisouti* Guillebeau, 1892; *Pyracoderus lemoroi* Guillebeau, 1892; and *Litochroides sharpi* Guillebeau, 1892.

Distribution: Algeria, Egypt, Morocco, Tunisia, Saudi Arabia, Jordan. New to the UAE.

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Order Coleoptera, family Tenebrionidae

(with the exception of the subfamily Alleculinae)

Wolfgang Schawaller*

* Contributions to Tenebrionidae no. 80.

INTRODUCTION

The family Tenebrionidae is one of the largest and most diverse within the Coleoptera, not only concerning morphology but also concerning ecological adaptations. Numerous species occur in all terrestrial habitats from the sea shore, in all types of forests up to dry desert and steppe habitats in all altitudinal belts. Most species have a nocturnal mode of life and can be found by light or Malaise traps as well by searching on the ground or on the bark of old trees with a torch. During day time, most species are hidden under stones and rotten plants as well under ground in sandy habitats. Only a few species are active during day, then running with high speed on the ground. The Tenebrionidae are perhaps the insects best known to the general public in the country (see Annex 1, 2).

The family contains more than 15,000 species, divided over 10 subfamilies, 96 tribes and 61 subtribes (Bouchard et al., 2005). The Tenebrionidae (with the exception of Alleculinae) of the Arabian Peninsula have been extensively studied by Kaszab (1981, 1982, 1986). Subsequent additions were published by Johnson (1989), by Schawaller (1990a, 1990b, 1991, 1993, 2007, 2009), and by Wagner (2003, 2005). More than 300 species and subspecies of Tenebrionidae have been recorded from Saudi Arabia, at least 190 from Yemen including the Socotra Archipelago and about 60 from Oman (Kaszab, 1982). From the UAE, until 2005 48 species were known (van Harten, 2005), this contribution raises the number of species to 65. The subfamily Alleculinae (4 species) in the UAE was treated separately (Novák, 2008).

The species identification of tenebrionids is easy in some groups, but in other groups difficult or even impossible due to different reasons. For example, the status of several described subspecies is doubtful and probably those taxa represent often just infraspecific variations. Additionally, several tenebrionid genera urgently need a modern revision, which might cause new species but also new synonyms. Finally the distribution of most species is only insufficiently known. Thus, the above given numbers of species and subspecies for certain areas are only a rough estimate.

MATERIALS AND METHODS

The specimens have been shared mainly between the United Arab Emirates Invertebrate Collection, the Staatliches Museum für Naturkunde in Stuttgart, Germany (SMNS), and the collection of Jan Batelka, Prague, Czech Republic. The photographs were produced in Stuttgart by my colleague Johannes Reibnitz by using a Leica DFC320 digital camera on a Leica MZ16 APO microscope and subsequent processing of the photographs by Auto-Montage (Synchroscopy) software.

Abbreviations used in the text: NARC = National Avian Research Centre; LT = light trap; MT = Malaise trap; PT = pitfall trap; WT = water trap; AvH = leg. A. van Harten; JB = leg. J. Batelka; HP = leg. H. Pinda.

SYSTEMATIC ACCOUNT

Subfamily Pimeliinae Latreille, 1802

Adesmia arabica wittmeri Kaszab, 1981

Plate 1

Specimens examined: Jebel Jibir, 1 ex., 27.iii.2007, JB & HP. Tawyain, Wadi Khabb, 1 ex., 16.iii.2007, JB & HP. Wadi Safad, 1 ex., 19.iii.2007, JB & HP; 1 ex., 13.iii.2008, leg. M. Hauser. Wadi Shawkah, 1 ex., 18.iii.2007, JB & HP. Wadi Wurayah, 1 ex., 25.iii.2007, JB & HP.

Length: 8–10 mm.

Distribution: Arabian Peninsula.

Adesmia cancellata clathrata Solier, 1835

Plate 2

Specimens examined: Jebel Hafit, Wadi Tarabat, 2 ex., 24.iii.2007, JB & HP. Jebel Jibir, 1380 m, 1 ex., 27.iii.2007, JB & HP. Near Khor Kalba, 1 ex., 12.iii.2005, AvH. 5 km S of Tawyain, Al Jareef, 1 ex., 16.iii.2007, JB & HP. Wadi Bih, 1 ex., 22.iii.2007, JB & HP. Wadi Maidaq, 5 ex., 21–22.i.2005, 7–14.iii.2006, WT, AvH. Wadi Safad, 1 ex., 2–26.i.2006, WT, AvH; 3 ex., 13.iii.2008, leg. M. Hauser. Wadi Sana, Al Hala, 294 m, 5 ex., 17.iii.2007, JB & HP. Wadi Shawkah, 3 ex., 2–11.iv.2007, WT, AvH. Wadi Wurayah, 2 ex., 24.ii.2005, AvH; 1 ex. 10–26.xii.2006, WT, AvH.

Length: About 20 mm.

Distribution: Near East, Arabian Peninsula, Iraq, Iran.

Adesmia cothurnata Forskål, 1775

Plate 3

Specimens examined: Jebel Hafit, Wadi Tarabat, 2 ex., 24.iii.2007, JB & HP. Sharjah Desert Park, 1 ex., 12.iii.2008, leg. M. Hauser. Wadi Sana, Al Hala, 294 m, 1 ex., 17.iii.2007, JB & HP.

Length: 12–15 mm.

Distribution: Near East, Egypt, Arabian Peninsula.

Akis subtricostata Redtenbacher, 1850

Plate 20

Specimen examined: Al-Rafah, 1 ex., 18–22.v.2008, WT, AvH.

Length: 26–28 mm.

Remarks: Kaszab (1982) recorded *Akis elevata* Solier, 1836, from the Arabian Peninsula. However, according to the photographs in that paper, these records belong to *Akis subtricostata* Redtenbacher, 1850. Both species can easily be separated by the shape of the pronotum (wider than elytra and posterior margin regularly excavated in *elevata*, narrower than elytra and posterior margin irregularly with an angle before hind corners in *tricostata*, compare figures in Schawaller, 1987).

Distribution: Near East, Iraq, Iran, Arabian Peninsula. New to the UAE.

Ammogiton omanicum Schawaller, 1990

Plate 4

Specimens examined: Ad-Dhaid, Tawi as-Saman, 2 ex., 15.iii.2007, JB & HP.

Length: About 4.5 mm.

Remarks: Psammophilous species. Identification confirmed by L. Soldati, who has a new species of this genus from Qatar and elsewhere under description.

Distribution: Oman. New to the UAE.

Apantanodes arabicus (Kirschberg, 1877)

Plate 5

Specimens examined: Adhan, Umm Urage al-Saadi, 2 ex., 16.iii.2007, JB & HP. Al-Ain, 2 ex., 22.iii.1993, leg. M. Gillett. N of Ajman, dunes, 1 ex., 17.ii.2009, leg. M. Jaschhof. Al-Muwaiji, 1 ex., 3.v.1993, leg. M. Gillett. Sharjah Desert Park, 3 ex., 1–12.ii.2009, PT, AvH.



Plates 1–4. 1: *Adesmia arabica wittmeri* Kaszab, 8–10 mm; 2: *Adesmia cancellata clathrata* Solier, about 20 mm; 3: *Adesmia cothurnata* Forskål, 12–15 mm; 4: *Ammogiton omanicum* Schawaller, about 4.5 mm. Length: 6–9 mm.

Distribution: Arabian Peninsula.

***Capnisiceps maindroni* Chatanay, 1914**

Plate 7

Specimens examined: Khor al-Khwair, 1 ex., 15–22.iii.2007, LT, AvH. OMAN: Al-Buraimi, 10 ex., 18.xii.2001, leg. M. Gillett.

Length: About 5 mm.

Distribution: Oman. New to the UAE.

***Capricephalus bazmanicus* (Schuster, 1938)**

Plate 6

Specimens examined: Ra's al-Khaimah airport, Ghaf forest, 1 ex., 27.ix.2007, JB & HP.

Length: About 7 mm.

Distribution: Iran, Oman, UAE.

***Cyphostethe ferruginea* (Marseul, 1867)**

Plate 8

Specimens examined: Al-Ajban, 1 ex., 6–22.v.2006, LT, AvH. Al-Aslab, 1 ex., 19.ix.2004, at light, AvH. Dubai, env. Margham, 163 m, 24°55'N 55°38'E, 1 ex., 24.ix.2007, at light, JB & HP. Dubai, Nazwa, 153 m, 25°04'N 55°43'E, 3 ex., 30.ix.2007, at light, JB & HP. Sharjah Desert Park, 10 ex., 30.iv–31.v.2005, 21.vii–5.viii.2005, 29.iii–6.iv.2006, all LT, AvH. Sharjah-Khor Kalba, near tunnel, 4 ex., 24–30.v.2006, LT, AvH; 3 ex., 26.iv–3.v.2006, LT, AvH. Wadi Bih dam, 1 ex., 22–29.iii.2007, LT, AvH.

Length: 6.0–6.5 mm.

Remarks: Psammophilous species.

Distribution: Sahara, Arabian Peninsula.

***Cyphostethe wittmeri* Kaszab, 1979**

Plate 9

Specimens examined: SSW of ad-Dhaid, 2 ex., 24–30.v.2006, LT, AvH. Hatta, 2 ex. 24–30.v.2006, 17–24.viii.2006, all LT, AvH. Ra's al-Khaimah, env. river dam, 24°59'N 56°07'E, 1 ex., 23.ix.2007, at light, JB & HP. Sharjah Desert Park, 1 ex., 6–28.xii.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 38 ex., 24–30.v.2006, 31.v–7.vi.2006, 7–14.vi.2006, all LT, AvH. Wadi Bih dam, 1 ex., 4–23.vii.2008, LT, AvH. Wadi Hayl, 25°04'N 56°13'E, 25 m, 3 ex., 5.x.2007, at light, JB & HP. Wadi Maidaq, 21 ex., 27.iv–4.v.2006, 1–8.vii.2006, LT, AvH. Wadi Safad, 46 ex., 15–22.iv.2006, 1–8.vii.2006, 17–24.vi.2006, all LT, AvH.

Length: About 7 mm.

Remarks: Psammophilous species.

Distribution: Arabian Peninsula. New to the UAE.

***Erodius* spec.**

Specimens examined: N of Ajman, beach, 2 ex., 11.iii.2008, leg. M. Hauser. N of Ajman, dunes, 2 ex., 17.ii.2009, leg. M. Jaschhof. Ad-Dhaid, Tawi as-Saman, oasis, 1 ex., 16.iii.2007, JB & HP; 1 ex., 19.iii.2007, leg. J. Batelka & A. Stark. Al-Rafah, 1–12.ii.2009, WT, AvH. S of Ra's al-Khaimah, 2 ex., 29.iii.2008, leg. J. Bosák. Sharjah Desert Park, 2 ex., 15.iii.2008, leg. K. Mahmood; 2 ex., 1–12.ii.2009, PT, AvH.

Remarks: At present state of knowledge, these specimens can not be identified properly to species. Kaszab (1981) treated only 6 species of that genus from the Arabian Peninsula, but described several subspecies, particularly of *Erodius sauditus* Kaszab, 1981. Strong arguments exist that some of these taxa are just synonyms, but others should be ranked up to species level. This taxonomic problem can not be solved in the present contribution. The genus is recorded from the UAE for the first time.



Plates 5–9. 5: *Apentanodes arabicus* (Kirschberg), 6–9 mm; 6: *Capricephalus bazmanicus* (Schuster), about 7 mm; 7: *Capnisiceps maindroni* Chatanay, about 5 mm; 8: *Cyphostethe ferruginea* (Marseul), 6–6.5 mm; 9: *Cyphostethe wittmeri* Kaszab, about 7 mm.

Himatismus villosus Haag-Rutenberg, 1870

Plate 11

Specimens examined: Env. ad-Dhaid, 2 ex., 23.ix.2007, JB & HP. SSW of ad-Dhaid, 2 ex., 24–30.v.2006, LT, AvH. Dubai, Mushrif Park, 1 ex., 6.iii.2005, AvH. Sharjah Desert Park, 3 ex., 29.iii–6.iv.2005, 6–28.xii.2006, all LT, AvH. NARC, near Sweihan, 20 ex., 1.ii–14.iii.2005, 14.iii–2.iv.2005, 2–30.iv.2005, 16.xi–21.xii.2005, all LT, AvH. Wadi Midaq, 1 ex., 26.xii.2006–20.iii.2007, MT, AvH.

Length: About 10 mm.

Remarks: *Himatismus arabicus* Kaszab, 1981, is probably a synonym of this widespread species. Arboreal species.

Distribution: Widespread in northern Africa, Near East, Mesopotamia and the Arabian Peninsula. New to the UAE.

Mesostena blairi Koch, 1940

Plate 10

Specimens examined: Jebel Jibir, 25°37'N 56°07'E, 700 m, 1 ex., 28.ix.2007, JB & HP. Wadi Midaq, 1 ex., 24.ix–22.x.2006, AvH.

Length: 17–18 mm.

Distribution: Arabian Peninsula.

Mesostena punccticollis Solier, 1835

Plate 13

Specimens examined: Adhan, Um Urage al-Saadi, 2 ex., 17.xi.2006, JB & HP. Al-Ajban, 4 ex., 27.iii.2008, leg. K. Mahmood. Ad-Dhaid, Tawi as-Saman, 2 ex. 15.iii.2007, JB & HP. Jebel Mileha, 2 ex., 20.iii.2007, JB & HP. Lahbab, 151 m, 5 ex., 21.xi.2006, JB & HP. Liwa, 2 km S of al-Khis, 1 ex., 24.xi.2006, JB & HP. Ra's al-Khaimah airport, Ghaf forest, 1 ex., 22.xi.2006, JB & HP. Sharjah Desert Park, 1 ex., 6–28.xii.2006, AvH. Um al-Quwain, 3 ex., 1–30.xi.2008, PT, AvH. Wadi Bih, 100 m, 1 ex., 22.iii.2007, JB & HP. Wadi Midaq, 1 ex., 23.ii.2007, AvH.

Length: 8–12 mm.

Distribution: Near East, Transcaspian, Mesopotamia, Arabian Peninsula.

Microdera marginata deserticola Blair, 1933

Plate 12

Specimens examined: Adhan, Um Urage al-Saadi, 4 ex., 17.xi.2006, JB & HP. Al-Ajban, 3 ex., 27.v–26.vi.2006, 26.vi–25.vii.2006, all MT, AvH. SSW of ad-Dhaid, 5 ex. 27.xi–1.xii.2006, AvH. S of Ra's al-Khaimah, 1 ex., 29.iii.2008, leg. J. Bosák; 1 ex., 11.iii.2008, leg. M. Hauser. Ra's al-Khaimah airport, Ghaf forest, 1 ex., 22.xi.2006, JB & HP. Sharjah Desert Park, 6 ex., 6–28.xii.2006, AvH; 1 ex., 19–22.iii.2008, leg. K. Mahmood. Um al-Quwain, 4 ex., 1–30.xi.2008, PT, AvH.

Length: 11–13 mm.

Distribution: Arabian Peninsula.

Mitotagenia biroi Koch, 1941

Plate 22

Specimens examined: Near Khor Kalba, 2 ex., 12.iii.2005, AvH.

Length: About 3 mm.

Distribution: Arabian Peninsula. New to the UAE.

Oxycara hansbremeri Lillig, 2001

Plate 15

Specimens examined: Ra's al-Khaimah airport, Ghaf forest, 4 ex., 22.xi.2006, JB & HP. Tawyain, 161 m, 1 ex., 18.xi.2006, JB & HP.

Length: 6–8 mm.

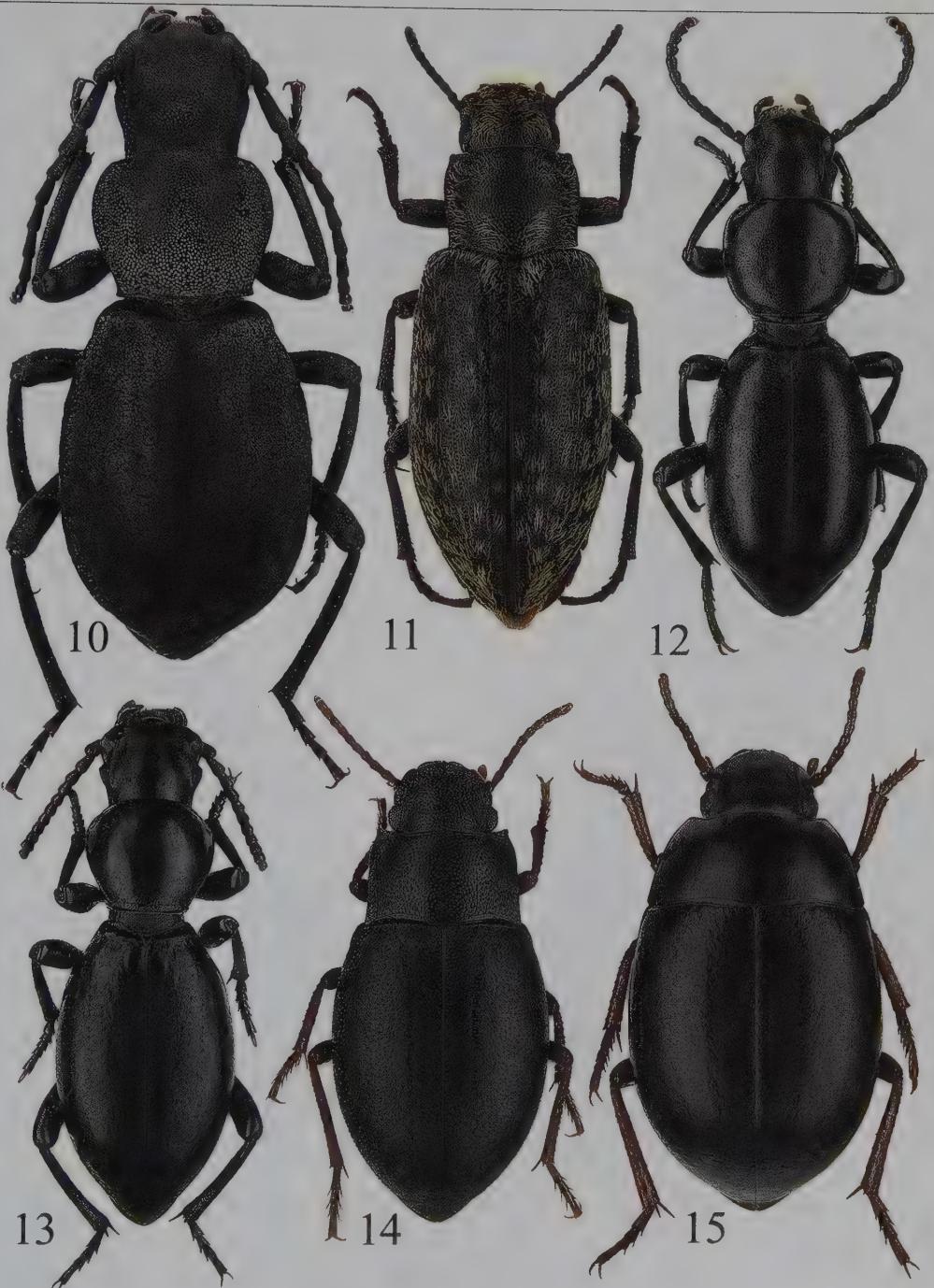
Distribution: Arabian Peninsula.

Oxycara saudarabica Kaszab, 1979

Plate 14

Specimens examined: Al-Ain, 6 ex., 3.x.2000, leg. M. Gillett.

Body length: 4–5 mm.



Plates 10–15. 10: *Mesostena blairi* Koch, 17–18 mm; 11: *Himatismus villosus* Haag-Rutenberg, about 10 mm; 12: *Microdera marginata deserticola* Blair, 11–13 mm; 13: *Mesostena puncticollis* Solier, 8–12 mm; 14: *Oxycara saudarabica* Kaszab, 4–5 mm; 15: *Oxycara hansbremeri* Lillig, 6–8 mm.

Remarks: *Oxycara saudarabica* Kaszab, 1979, and *Oxycara buettikeri* Kaszab, 1979, both recorded from the UAE, are quite similar and probably represent only a single biospecies.
 Distribution: Arabian Peninsula.

***Pachycera pygmaea arabica* (Koch, 1940)**

Plate 16

Specimens examined: Desert farm, 140 m, 3 ex., 12.iii.2008, leg. M. Hauser. Dibba, 10 ex., 20.ii.1989, leg. H.J. Bremer. Khor Kalba, 2 ex., 6.x–1.xii.1993, leg. I. Izsák. Near Khor Kalba, 1 ex., 12.iii.2005, AvH. Ra's al-Khaimah airport, Ghaf forest, 3 ex., 27.ix.2007, under stones, JB & HP. Sharjah, 1 ex., 29.xii.2006, leg. N. van Harten. Wadi Maidaq, 4 ex., 20.ii–2.iii.2009, WT, AvH. Wadi Safad, 1 ex., 19.ii.2005, AvH. Wadi Shawkah, 13 ex., 25.ix.2007, under stones, JB & HP.

Length: About 5.5 mm.

Distribution: Arabian Peninsula.

***Paraplatyope popovi* Koch, 1965**

Plate 21

Specimens examined: Ad-Dhaid, Tawi as-Saman, 125 m, 2 ex., 15.iii.2007, JB & HP. Wadi Yudayyah, 190 m, 1 ex. 18.iii.2007, JB & HP.

Length: 17–20 mm.

Distribution: Arabian Peninsula. New to the UAE.

***Piestognathoides bahrainicus* Kaszab, 1981**

Plate 23

Specimens examined: Ad-Dhaid, Tawi as-Saman, 15 ex. 15.iii.2007, JB & HP. Dubai, env. Margham, 163 m, 24°55'N 55°38'E, 5 ex., 24.ix.2007, 4.x.2007, JB & HP. Dubai, Tawi al-Faqa, 221 m, 24°38'N 55°31'E, 2.x.2007, JB & HP. Sharjah Desert Park, 1 ex., 19–22.iii.2008, leg. K. Mahmood.

Length: 7–10 mm.

Remarks: Specimens from Tawi al-Saman, Margham and Tawi al-Faqa were collected at night with torch on sand dunes.

Distribution: Bahrain. New to the UAE.

***Pimelia arabica* Klug, 1830**

Plate 24

Specimens examined: Adhan, Um Urage al-Saadi, 3 ex., 17.xi.2006, JB & HP. Ad-Dhaid, Tawi as-Saman, 2 ex. 18.xi.2006, JB & HP. SSW of ad-Dhaid, 1 ex. 27.xi–1.xii.2006, AvH. Liwa, 2 km S of al-Khis, 1 ex., 24.xi.2006, JB & HP. Ra's al-Khaimah airport, Ghaf forest, 2 ex., 22.xi.2006, JB & HP. Sharjah Desert Park, 2 ex., 6–28.xii.2006, LT, AvH; 1 ex., 19.iii.2008, leg. M. Hauser; 3 ex., 1–30.xi.2008, PT, AvH; 1 ex., 1–12.ii.2009, PT, AvH. Um al-Quwain, 7 ex., 1–30.xi.2008, PT, AvH.

Length: About 23 mm.

Remarks: There exists separation into several doubtful subspecies, probably only morphological variations.

Distribution: Egypt, Near East, Iraq, Arabian Peninsula.

***Prionotheca coronata ovalis* Ancey, 1881**

Plate 25

Specimens examined: SSW of ad-Dhaid, 2 ex. 27.xi–1.xii.2006, AvH. Ad-Dhaid, Tawi as-Saman, 13 ex. 21.ix.2007, 18.xi.2006, JB & HP. Wadi Maidaq, 1 ex., 23.ii.2007, AvH.

Length: 30–35 mm.

Remarks: Status of the subspecies is doubtful, probably synonymous to the nominate form. Regularly in camel dung.

Distribution: Northern Africa, Arabian Peninsula, Mesopotamia.

***Prochoma bucculenta* Koch, 1940**

Plate 19

Specimens examined: Al-Ain al-Faydah, 14 ex., 9.xi.2001, 27.xii.2001, 2.i.2002, leg. M. Gillett.



Plates 16–20. 16: *Pachycera pygmaea arabica* (Koch), about 5.5 mm; 17: *Pseudosericius maculosus* Fairmaire, about 5 mm, 18: *Sclerum evansi* Blair, 6–7 mm, 19: *Prochoma bucculenta* Koch, 9–12 mm, 20: *Akis subtricostata* Redtenbacher, 26–28 mm.

Length: 9–12 mm.

Distribution: Iran, Kuwait, Arabian Peninsula.

***Scelosodis besnardi* Kaszab, 1981**

Specimens examined: Dubai, env. Tawi al-Faqa, 221 m, 24°38'N' 55°31'E, 1 ex., 2.x.2007, on sand dunes, JB & HP.

Length: About 10 mm.

Remarks: Psammophilous species.

Distribution: Saudi Arabia, UAE.

***Stegastopsis arabica* Allard, 1883**

Plate 28

Specimens examined: Jebel Jibir, 1 ex., 27.iii.2007, JB & HP. Wadi Bih, 1 ex., 22.iii.2007, JB & HP. Wadi Safad, 1 ex., 19.iii.2007, JB & HP.

Length: 12–13 mm.

Distribution: Arabian Peninsula. New to the UAE.

***Tentyrina deserta sparsepunctata* Kaszab, 1981**

Plate 27

Specimens examined: Adhan, Um Urage al-Saadi, 1 ex., 17.xi.2006, JB & HP. Ra's al-Khaimah airport, Ghaf forest, 2 ex., 22.xi.2006, JB & HP.

Length: 11–15 mm.

Distribution: Arabian Peninsula.

***Tentyrina palmeri* (Crotch, 1872)**

Plate 26

Specimens examined: SSW of ad-Dhaid, 1 ex. 21.ii.2007, AvH. Ad-Dhaid, Tawi as-Saman, 1 ex. 15.iii.2007, JB & HP.

Length: 12–18 mm.

Distribution: Libya, Egypt, Near East, Arabian Peninsula.

***Thraustocolus arabicus* Kaszab, 1979**

Plate 29

Specimens examined: Jebel Hafit, 1 ex., 13.iii.2005, AvH. Jebel Jibir, 1000–1380 m, 6 ex., 16–27.iii.2007, under stones, JB & HP.

Length: 6–7 mm.

Remarks: The genus needs a taxonomic revision, thus the identifications remain somewhat uncertain.

Distribution: Arabian Peninsula.

***Thriptera kraatzi* Haag-Rutenberg, 1876**

Plate 30

Specimens examined: Jebel Jibir, 1 ex., 27.iii.2007, JB & HP; 1 ex., 17.iii.2008, leg. K. Mahmood. Ra's al-Khaimah airport, Ghaf forest, 7 ex., 22.xi.2006, JB & HP. Sharjah, 1 ex., 27.vii.2006, AvH. Um al-Quwain, 6 ex., 6.x–1.xii.1993, leg. I. Izsák. Wadi Midaq, 1 ex., 24.ix–22.x.2006, WT, AvH; 1 ex., 15.iii.2008, leg. M. Hauser. Wadi Safad, 3 ex., 28.xi–1.xii.2005, AvH. Wadi Sana, al-Hala, 294 m, 1 ex., 17.iii.2007, JB & HP. Wadi Shawkah, 4 ex., 31.x–27.xi.2006, 2–11.iv.2007, 25.v–2.vi.2008, all WT, AvH. Wadi Siji, 1 ex., 24.ix.2005–22.i.2006, WT, AvH.

Length: 17–21 mm.

Distribution: Arabian Peninsula.

***Trachyderma philistina* Reiche & Saulcy, 1857**

Plate 31

Specimens examined: Dubai, Al-Bustan, 1 ex., 25.x.2003, leg. D. Daubner. Ad-Dhaid, Tawi as-Saman, 2 ex. 15.iii.2007, JB & HP. Um al-Quwain, Biatah, 1 ex. 17.xi.2006, JB & HP.



Plates 21–25. 21: *Paraplatyope popovi* Koch, 17–20 mm; 22: *Mitotagenia biroi*, about 3 mm; 23: *Piestognathoides bahrainicus* Kaszab, 7–10 mm; 24: *Pimelia arabica* Klug, about 23 mm; 25: *Prionotheca coronata ovalis* Ancey, 30–35 mm.

Length: About 21 mm.

Distribution: Widespread in the Mediterranean, Egypt, Near East, Mesopotamia, Arabian Peninsula.

Trichosphaena arabica Kaszab, 1961

Plate 32

Specimens examined: Al-Ajban, 4 ex., 27.v–26.vi.2006, LT, AvH. Al-Aslab, 12 ex., 19.ix.2004, at light, AvH. Ad-Dhaid, Ibn Rasheed, 3 ex., 23.ix.2007, JB & HP. Ad-Dhaid, Tawi as-Saman, 1 ex. 16.iii.2007, JB & HP. SSW of ad-Dhaid, 20 ex., 24–30.v.2006, LT, AvH. Near Digdaga, 1 ex. 16.iii.2008, leg. K. Mahmood. Dubai, Nazwa, 153 m, 25°04'N 55°43'E, 9 ex., 30.ix.2007, at light, JB & HP. Near Mahafiz, 2 ex., 20.iii.2008, leg. K. Mahmood. S of Ra's al-Khaimah, 3 ex., 29.iii.2008, 6.iv.2008, leg. J. Bosák. Sharjah Desert Park, 31 ex., 30.iv–31.v.2005, 31.v–30.vi.2005, 30.vi–21.vii.2005, 21.vii–5.viii.2005, all LT, AvH. NARC, near Sweihan, 1 ex., 2–30.iv.2005, LT, AvH. Wadi Siji, 1 ex., 24.ix.2005–22.i.2006, WT, AvH.

Length: About 6.5 mm.

Remarks: Psammophilous species. Kaszab (1981) noted also *Trichosphaena perraudieri* (Marseul, 1867) from the Arabian Peninsula, as yet unknown from the UAE. This species has a keeled lateral margin of the pronotum, in *Trichosphaena arabica* this margin is unkeeled.

Distribution: Arabian Peninsula.

Zophosis pharaonis simplex Kaszab, 1981

Plate 33

Specimens examined: Sharjah Desert Park, 3 ex., 6–28.xii.2006, LT, AvH; 1 ex., 19–22.iii.2008, leg. K. Mahmood; 8 ex., 1–30.xi.2008, PT, AvH; 9 ex., 1–12.ii.2009, PT, AvH.

Length: 6–7 mm.

Remarks: The subspecies *simplex* Kaszab, 1981, was described from the Emirates under the name *Zophosis migneuxi* Deyrolle, 1867, but transferred to *Zophosis pharaonis* Reitter, 1916, by Penrith (1984).

Distribution: Arabian Peninsula.

Zophosis sulcata Deyrolle, 1867

Plate 34

Specimens examined: Wadi Siji, 10 ex., 24.ix.2005–22.i.2006, WT, AvH.

Length: 7–9 mm.

Remarks: The specimens of this series are somewhat smaller than other Arabian specimens (10–12 mm) and the dorsal elytral structure is less developed, all other characters coincide.

Distribution: Egypt, Sudan, Arabian Peninsula. New to the UAE.

Subfamily **Tenebrioninae** Latreille, 1802

Alphitobius diaperinus (Panzer, 1797)

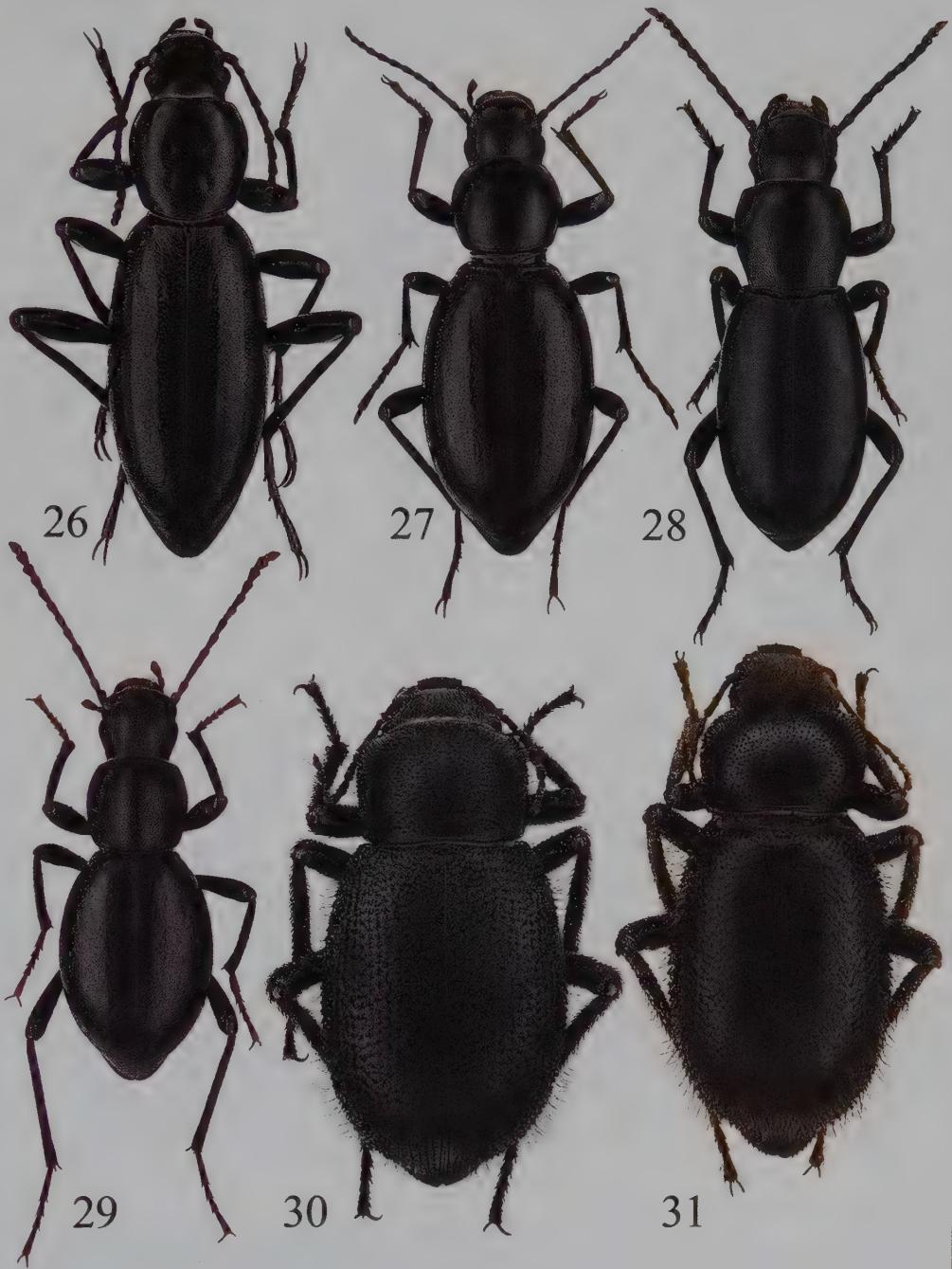
Plate 35

Specimens examined: Al-Ajban, 12 ex., 6–22.v.2006, LT, AvH. SSW of ad-Dhaid, 3 ex., 24–30.v.2006, LT, AvH. Fujairah, 15 ex., 5.iii–6.iv.2005, 16–24.ii.2005, 6.iv–2.v.2005, 2.v–5.vi.2005, 29.xi.2005–2.i.2006, 15–22.iv.2006, all LT, AvH. Hatta, 4 ex., 8–26.iv.2006, LT, AvH. Sharjah Desert Park, 17 ex., 30.iv–31.v.2005, 28.i–25.ii.2006, 21.xii.2006–23.i.2007, all LT, AvH. Sharjah-Khor Kalba, near tunnel, 7 ex., 7–22.iii.2006, 24–30.v.2006, all LT, AvH. NARC, near Sweihan, 1 ex., 14.iii–2.iv.2005, LT, AvH. Wadi Maidaq, 2 ex., 2–16.ii.2006, LT, AvH. Wadi Safad, 3 ex., 31.i–21.ii.2006, 15–22.iv.2006, all LT, AvH.

Length: 5–7 mm.

Remarks: Synanthropic species.

Distribution: Cosmopolitan.



Plates 26–31. 26: *Tentyrina palmeri* (Crotch), 12–18 mm; 27: *Tentyrina deserta sparssepunctata* Kaszab, 11–15 mm; 28: *Stegastopsis arabica* Allard, 12–13 mm; 29: *Thraustocolus arabicus* Kaszab, 6–7 mm; 30: *Thriptera kraatzi* Haag-Rutenberg, 17–21 mm; 31: *Trachyderma philistina* Reiche & Saulcy, about 21 mm.

***Alphitobius laevigatus* (Fabricius, 1781)**

Plate 36

Specimens examined: Hatta, 1 ex., 24–30.v.2006, LT, AvH. Sharjah Desert Park, 8 ex., 29.iii–6.iv.2005, 6–30.iv.2005, 30.iv–31.v.2005, 31.v.–30.vi.2005, 30.vi–21.vii.2005, all LT, AvH. Sharjah-Khor Kalba, 2 ex., 7–22.iii.2006, LT, AvH.

Length: 4.5–6 mm.

Remarks: Synanthropic species.

Distribution: Cosmopolitan. New to the UAE.

***Apsheronellus arenarius* Bogatchev, 1967**

Plate 37

Specimens examined: Sharjah Desert Park, 12 ex., 6–28.xii.2006, LT, AvH. KUWAIT: W. Umm al-Ruman, 90 m, 1 ex., 18.ii.1988, leg. W. Büttiker, SMNS.

Length: 3–3.5 mm.

Remarks: The newly collected specimens from Kuwait and the Emirates should be compared with the types, described from the Caspian Apsheron Peninsula near Baku in Azerbaijan. The present distributional pattern is unusual and could be a hint against conspecificity.

Distribution: Azerbaijan. New to the UAE and Kuwait.

***Blaps kollari* Seidlitz, 1896**

Plate 38

Specimens examined: Sharjah Desert Park, 4 ex., 6–28.xii.2006, PT, AvH; 4 ex., 1–30.xi.2008, PT, AvH. Ad-Dhaid, Tawi as-Saman, 106 m, 1 ex. 20.xi.2006, JB & HP. Dubai, env. Margham, 163 m, N 24°55' E 55°38', 2 ex., 24.ix.2007, JB & HP. Al-Rafah, 1 ex., 27–30.iv.2008, WT, AvH. Um al-Quwain, 6 ex., 1–30.xi.2008, PT, AvH.

Length: 30–40 mm.

Distribution: Egypt, Near East, Arabian Peninsula.

***Cheirodes asperulus* (Reitter, 1884)**

Specimens examined: Al-Ajban, 5 ex., 25.ii–27.iii.2006, LT, AvH. Sharjah Desert Park, 2 ex., 10–17.iii.2007, LT, AvH. Wadi Wurayah farm, 1 ex., 22.ii–2.iii.2009, LT, AvH.

Length: About 3 mm.

Distribution: Northern Africa, Arabian Peninsula, Iran. New to the UAE.

***Cheirodes brevicollis* (Wollaston, 1864)**

Plate 39

Specimens examined: Al-Ajban, 6 ex., 25.ii–27.iii.2006, 27.v–26.vi.2006, LT, AvH. SSW of ad-Dhaid, 10 ex., 24–30.v.2006, LT, AvH. Hatta, 1 ex., 24–30.v.2006, LT, AvH. Sharjah, Jebel Mileiha, highway 116, 1 ex., 20.iii.2007, JB & HP. Sharjah Desert Park, 31 ex., 29.iii–6.iv.2005, 31.v–30.vi.2005, 30.vi–21.vii.2005, 21.vii–5.viii.2005, all LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 7–14.vi.2006, LT, AvH.. NARC, near Sweihan, 5 ex., 14.iii–2.iv.2005, 2–30.iv.2005, 16.xi–21.xii.2005, 26.ii–2.iv.2006, all LT, AvH. Wadi Midaq, 2 ex., 27.iv–4.v.2006, 1–8.vii.2006, LT, AvH.

Length: About 4 mm.

Remarks: Listed by Gillett & Howarth (2004) as *Anemia brevicollis*.

Distribution: Widespread in the Mediterranean, northern Africa, Central Asia, Arabian Peninsula.

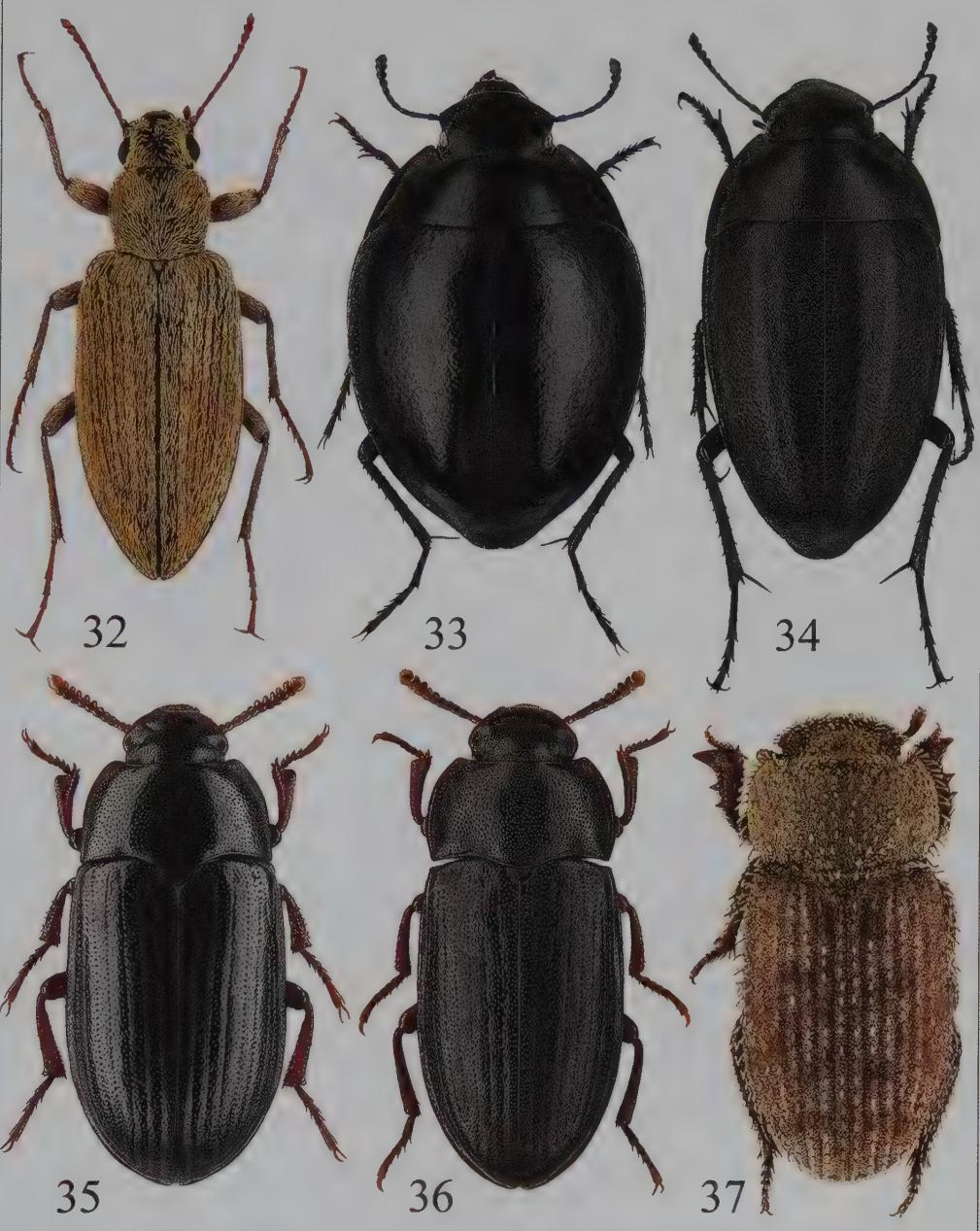
***Cheirodes pilosus* (Tournier, 1868)**

Plate 40

Specimens examined: Al-Ajban, 14 ex., 1.iv–2.v.2006, 6–22.v.2006, 27.v–26.vi.2006, all LT, AvH. Sharjah Desert Park, 1 ex., 6–30.iv.2005, LT, AvH. NARC, near Sweihan, 5 ex., 14.iii–2.iv.2005, 2–30.iv.2005, all LT, AvH.

Length: 4–5 mm.

Distribution: Widespread in northern Africa, Chad, Sudan, Arabian Peninsula. New to the UAE.



Plates 32–37. 32: *Trichosphaena arabica* Kaszab, about 6.5 mm; 33: *Zophosis pharaonis simplex* Kaszab, 6–7 mm; 34: *Zophosis sulcata* Deyrolle, 7–9 mm; 35: *Alphitobius diaperinus* (Panzer), 5–7 mm; 36: *Alphitobius laevigatus* (Fabricius), 4.5–6 mm; 37: *Apsheronellus arenarius* Bogatchev, 3–3.5 mm.

***Cheiromys sardous* (Gené, 1839)**

Specimens examined: Al-Ajban, 3 ex., 25.ii–27.iii.2006, LT, AvH. SSW of ad-Dhaid, 1 ex., 24–30.v.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 3 ex., 7–22.iii.2006, 24–30.v.2006, 31.v–7.vi.2006, all LT, AvH. Wadi Maidaq, 11 ex., 2–16.ii.2006, 27.iv–4.v.2006, 1–8.vii.2006, all LT, AvH. Wadi Safad, 2 ex., 31.i–21.ii.2006, 1–8.vii.2006, all LT, AvH.

Length: 5.5–6.5 mm.

Distribution: Widespread in the Mediterranean, northern Africa, Near East, Arabian Peninsula.

***Clitobius oblongiusculus* (Fairmaire, 1875)**

Plate 41

Specimens examined: Al-Ajban, 3 ex., 27.v–26.vi.2006, LT, AvH. SSW of ad-Dhaid, 3 ex., 24–30.v.2006, LT, AvH. Sharjah Desert Park, 13 ex., 3.iii.2005, 14.x.2005, 6–30.iv.2005, all LT, AvH. Sharjah-Khor Kalba, near tunnel, 2 ex., 7–14.vi.2006, LT, AvH. NARC, near Sweihan, 11 ex., 14.iii–2.iv.2005, LT, AvH. Al-Wathba wetland reserve, 14 ex., 23.viii.2004, 6.ix.2004, all AvH.

Length: About 5.5 mm.

Remarks: Halophilous species.

Distribution: Widespread in northern Africa, Near East, Transcaspian, Mesopotamia and Arabian Peninsula. New to the UAE.

***Gonocephalum besnardi* Kaszab, 1982**

Plate 42

Specimens examined: Al-Ajban, 9 ex., 25.ii–27.iii.2006, 27.v–26.vi.2006, all LT, AvH. SSW of ad-Dhaid, 2 ex., 24–30.v.2006, LT, AvH. Dubai, Mushrif Park, 8 ex., 6.iii.2005, AvH. Ra's al-Khaimah, near International Airport, Ghaf forest, 1 ex., 27.ix.2007, JB & HP. Sharjah Desert Park, 111 ex., 14.x.2004, at light; 20–23.xi.2004, WT; 6–28.xii.2006, PT; all AvH. Sharjah-Khor Kalba, near tunnel, 3 ex., 7–22.iii.2006, 24–30.v.2006, 7–14.vi.2006, all LT, AvH. Wadi Maidaq, 4 ex., 2–16.ii.2006, LT, AvH.

Length: About 10 mm.

Remarks: Described from the UAE (Ra's al-Khaimah).

Distribution: Arabian Peninsula.

***Gonocephalum griseovittatum* Gridelli, 1939**

Specimens examined: Dubai, 1 ex., vi.1998, leg. P.D. Johnson, HNHM. Fujairah, 7 ex., 29.xi.2005–2.i.2006, 15–22.iv.2006, all LT, AvH.

Length: 8–9 mm.

Remarks: Identification insecure, specimens not compared with type material.

Distribution: Ethiopia, Oman. New to the UAE.

***Gonocephalum prolixum* Erichson, 1843**

Plate 43

Specimens examined: Al-Ajban, 1 ex., 6–22.v.2006, LT, AvH. Fujairah, 2 ex., 2.v–5.vi.2005, 15–22.iv.2006, all LT, AvH. Sharjah Desert Park, 1 ex., 29.iii–6.iv.2005, LT, AvH.

Length: About 7 mm.

Remarks: The subspecies *inornatum* Schuster, 1938, from Arabia is a synonym of the nominate form.

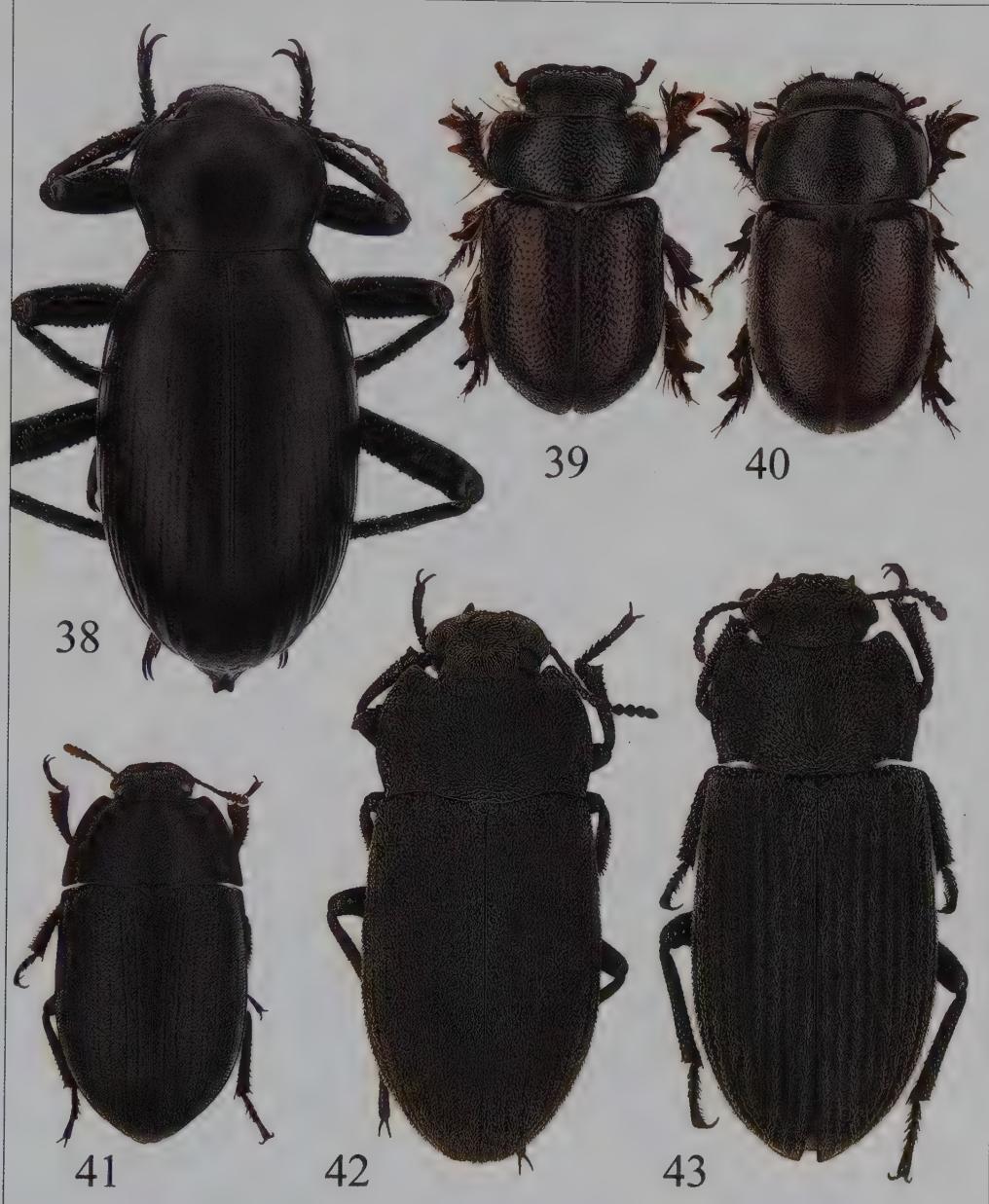
Distribution: Widespread in the Mediterranean, northern Africa, Arabian Peninsula.

***Gonocephalum setulosum* (Faldermann, 1837)**

Plate 44

Specimens examined: Al-Ajban, 2 ex., 25.ii–27.iii.2006, 6–22.v.2006, all LT, AvH. SSW of ad-Dhaid, 1 ex., 24–30.v.2006, LT, AvH. Hatta, 1 ex., 17–24.viii.2006, LT, AvH. Ra's al-Khaimah, near International Airport, Ghaf forest, 12 ex., 27.ix.2007, at light, JB & HP. Sharjah Desert Park, 8 ex., 6–30.iv.2005, 31.v–30.vi.2005, 30.vi–21.vii.2005, 25.ii–25.iii.2006, all LT, AvH. Sharjah-Khor Kalba, near tunnel, 1 ex., 31.v–7.vi.2006, LT, AvH. NARC, near Sweihan, 1 ex., 1.ii–14.iii.2005, LT, AvH. Wadi Maidaq, 1 ex., 27.iv–4.v.2006, LT, AvH.

Length: About 5 mm.



Plates 38–43. 38: *Blaps kollaris* Seidlitz, 30–40 mm; 39: *Cheirodes brevicollis* (Wollaston), about 4 mm; 40: *Cheirodes pilosus* (Tournier), 4–5 mm; 41: *Clitobius oblongiusculus* (Fairmaire), about 5.5 mm; 42: *Gonocephalum besnardi* Kaszab, about 10 mm; 43: *Gonocephalum prolixum* Erichson, about 7 mm.

Distribution: Widespread in the Mediterranean, northern Africa, Transcaspian, Iran, Iraq, Arabian Peninsula. New to the UAE.

Gonocephalum sorcinum (Reiche & Saulcy, 1857)

Plate 45

Specimens examined: Wadi Hayl, 225 m, 1 ex., 5.x.2007, JB & HP. Wadi Midaq, 1 ex., 27.iv–4.v.2006, LT, AvH. Wadi Safad, 1 ex., 28.xi–1.xii.2005, WT, AvH.

Length: 14–15 mm.

Distribution: Sahara, Ethiopia, Egypt, Arabian Peninsula, Near East, Afghanistan. New to the UAE.

Latheticus orizae Waterhouse, 1880

Plate 46

Specimens examined: Al-Ajban, 4 ex., 6–22.v.2006, 27.v–26.vi.2006, 17.x–9.xi.2006, all LT, AvH. SSW of ad-Dhaid, 2 ex., 24–30.v.2006, LT, AvH. Fujairah, 2 ex., 15–22.iv.2006, LT, AvH. Hatta, 1 ex., 24–30.v.2006, LT, AvH. Near Mahafiz, 7 ex., 21–28.xii.2006, LT, AvH. Sharjah Desert Park, 7 ex., 6–30.iv.2005, 31.v–30.vi.2005, 30.vi–21.vii.2005, all LT, AvH. Sharjah-Khor Kalba, near tunnel, 2 ex., 24–30.v.2006, LT, AvH. Wadi Midaq, 1 ex., 27.iv–4.v.2006, LT, AvH. Wadi Safad, 17 ex., 31.i–21.ii.2006, 15–22.iv.2006, 1–8.vii.2006, all LT, AvH.

Length: About 3 mm.

Remarks: Synanthropic species.

Distribution: Cosmopolitan. New to the UAE.

Leichenium muelleri Gridelli, 1939

Plate 47

Specimens examined: Ra's al-Khaimah, Ghaf Forest, 1 ex., 27.ix.2007, JB & HP. Sharjah Desert Park, 7 ex., 29.iii–6.iv.2005, LT, AvH.

Length: 3–4 mm.

Distribution: Sudan, Arabian Peninsula. New to the UAE.

Leichenium pulchellum pumilum Baudi, 1876

Plate 48

Specimens examined: Al-Ajban, 46 ex., 6–22.v.2006, 27.v–26.vi.2006, all LT, AvH. SSW of ad-Dhaid, 30 ex., 24–30.v.2006, LT, AvH. Fujairah, 4 ex., 2.v–5.vi.2005, 5.vi–2.vii.2005, all LT, AvH. Hatta, 14 ex., 8–26.iv.2006, 24–30.v.2006, all LT, AvH. Jebel Ali Hotel, 1 ex., 26.iv.1996, leg. J. Wiesner & I. Worm. Sharjah Desert Park, 21 ex., 29.iii–6.iv.2005, 6–30.iv.2005, 30.iv–31.v.2005, 31.v–30.vi.2005, 30.vi–21.vii.2005, 6–28.xii.2006, all LT, AvH. Sharjah-Khor Kalba, near tunnel, 6 ex., 26.iv–3.v.2006, 24–30.v.2006, 7–14.vi.2006, all LT, AvH. Wadi Bih dam, 1 ex., 22–29.iii.2007, LT, AvH. Wadi Midaq, 8 ex., 27.iv–4.v.2006, 26.xii.2006–20.iii.2007, LT, MT, AvH. Wadi Safad, 7 ex., 15–22.iv.2006, 17–24.vi.2006, 1–8.vii.2006, all LT, AvH. Wadi Shawkah, 250–280 m, 2 ex., 25.ix.2007, JB & HP. Wadi Wurayah farm, 1 ex., 22.ii–2.iii.2009, LT, AvH.

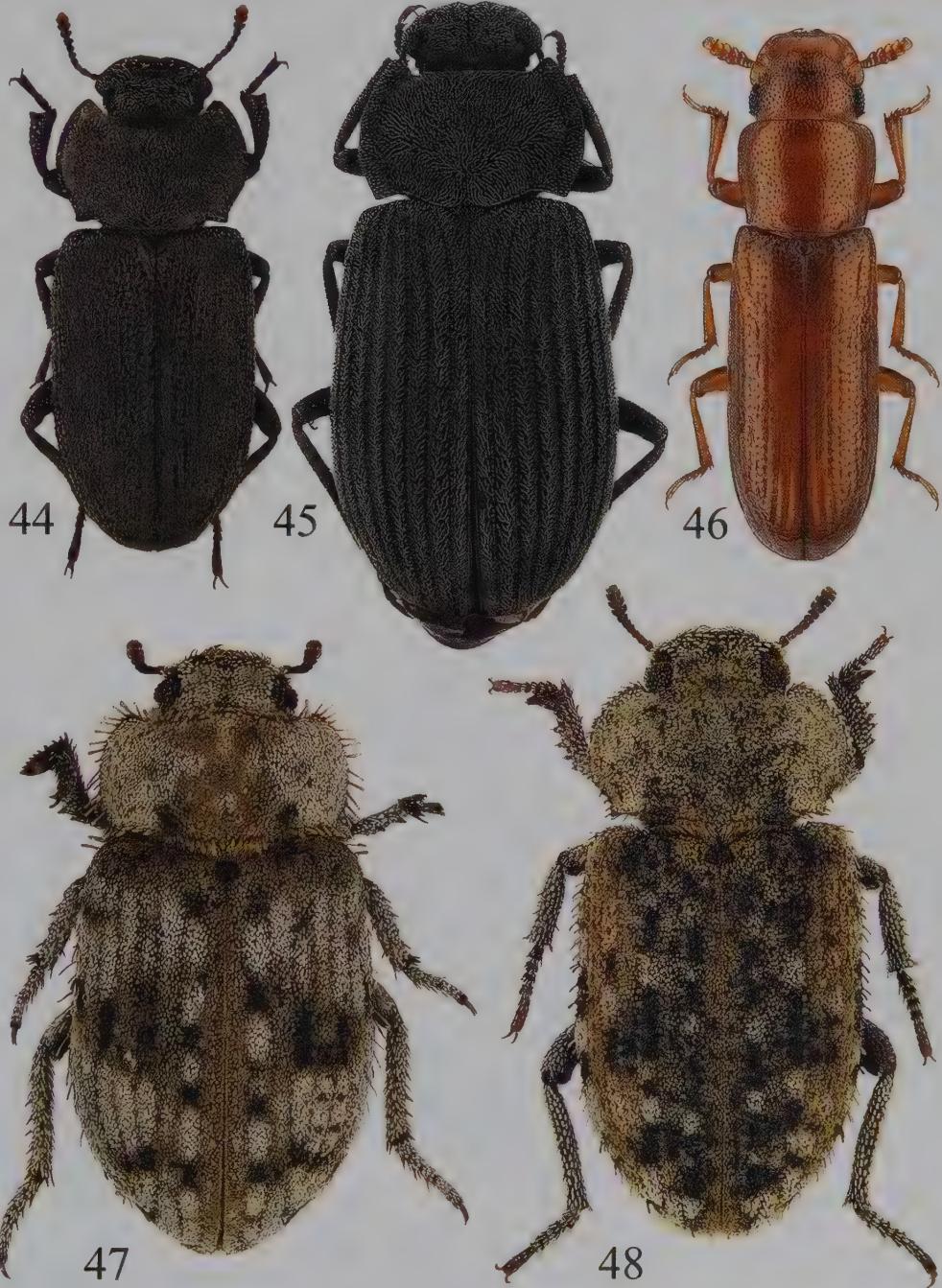
Length: About 4 mm.

Distribution: Widespread in northern Africa, Near East, Mesopotamia, Arabian Peninsula.

Opatrioides vicinus (Fairmaire, 1886)

Plate 49

Specimens examined: Al-Ajban, 12 ex., 25.ii–27.iii.2006, 27.v–26.vi.2006, all LT, AvH. 15 km NE of ad-Dhaid, 158 m, 17.iii.2007, JB & HP. SSW of ad-Dhaid, 2 ex., 24–30.v.2006, LT, AvH. Dubai, Margham, 163 m, 2 ex., 19.xi.2006, JB & HP. Dubai, Mushrif Park, 1 ex., 6.iii.2005, AvH. Fujairah, 37 ex., 5.iii–6.iv.2005, 6.iv–2.v.2005, 2.v–5.vi.2005, 5.vi–2.vii.2005, 15–22.iv.2006, all LT, AvH. Hatta, 6 ex., 8–26.iv.2006, LT, AvH. Jebel Hafit, 2 ex., 13.iii.2005, 8.iv.2005, AvH. NARC, near Sweihan, 5 ex., 1.ii–14.iii.2005, 14.iii–2.iv.2005, LT, AvH. Ra's al-Khaimah, Ghaf Forest, 2 ex., 22.xi.2006, JB & HP. Sharjah Desert Park, 13 ex., 29.iii–6.iv.2005, 6–30.iv.2005, 30.iv–31.v.2005, 28.i–25.ii.2006, all LT, AvH. Sharjah-Khor Kalba, near tunnel, 8 ex., 24–30.v.2006, 7–14.vi.2006, all LT, AvH. Wadi Bih dam, 2 ex., 4–23.vii.2008, LT. Wadi Midaq, 16 ex., 27.iv–4.v.2006, LT, AvH. Wadi Safad, 7 ex., 15–22.iv.2006, LT, AvH.



Plates 44–48. 44: *Gonocephalum setulosum* (Faldermann), about 5 mm; 45: *Gonocephalum soricinum* (Reiche & Saulcy), 14–15 mm; 46: *Latheticus orizae* Waterhouse, about 3 mm; 47: *Leichenium muelleri* Gridelli, 3–4 mm; 48: *Leichenium pulchellum pumilum* Baudi, about 4 mm.

Length: About 8.5 mm.

Distribution: Widespread in northern India, Pakistan, Afghanistan, Arabian Peninsula.

***Palorus fusicola* (Wollaston, 1867)**

Plate 50

Specimens examined: Hatta, 4 ex., 24–30.v.2006, LT, AvH. Sharjah Desert Park, 7 ex., 30.vi–21.vii.2005, AvH.

Length: About 2.5 mm.

Remarks: Synanthropic species.

Distribution: Cape Verde, Africa, Pakistan, Sri Lanka, Arabian Peninsula. New to the UAE.

***Palorus subdepressus* (Wollaston, 1864)**

Plate 51

Specimens examined: Al-Ajban, 14 ex., 6–22.v.2006, 27.v–26.vi.2006, LT, AvH. SSW of ad-Dhaid, 4 ex., 24–30.v.2006, LT, AvH. Fujairah, 1 ex., 6.iv–2.v.2005, LT, AvH. Hatta, 13 ex., 8–26.iv.2006, 24–30.v.2006, LT, AvH. Sharjah Desert Park, 4 ex., 31.v–30.vi.2005, 30.vi–21.vii.2005, LT, AvH. Wadi Midaq, 2 ex., 27.iv–4.v.2006, 1–8.vii.2006, all LT, AvH. Wadi Safad, 1 ex., 31.i–21.ii.2006, LT, AvH.

Length: About 3 mm.

Remarks: Synanthropic species.

Distribution: Cosmopolitan. New to the UAE.

***Phtora subclavata* (Wollaston, 1861)**

Plate 52

Specimens examined: Al-Ajban, 27 ex., 28.xii.2005–29.i.2006, 25.ii–27.iii.2006, 6–22.v.2006, 27.v–26.vi.2006, all LT, AvH. Fujairah, 2 ex., 20–27.v.2006, LT, AvH. Hatta, 4 ex., 7–24.v.2006, 24–30.V.2006, LT, AvH. Khor al-Khwair, 2 ex., 17–24.iv.2007, LT, AvH. Near Mahafiz, 2 ex., 21–28.iii.2006, LT, AvH. Sharjah Desert Park, 11 ex., 6–30.iv.2005, 31.v–30.vi.2005, 30.vi–21.vii.2005, 18.i.–25.ii.2006, 3–10.iii.2007, 5–12.v.2007, 20.x–24.xi.2007, 4.viii–4.ix.2008, all LT, AvH. Sharjah–Khor Kalba, near tunnel, 13 ex., 16–31.i.2006, 7–22.iii.2006, 24–30.v.2006, 31.v–7.vi.2006, 7–14.vi.2006, all LT, AvH. NARC, near Sweihan, 28 ex., 14.iii–2.iv.2005, 2–30.iv.2005, 30.i–26.ii.2006, 26.ii–2.iv.2006, all LT, AvH. Wadi Bih dam, 4–23.vii.2008, LT, AvH. Wadi Hayl, 3 ex., 28.iii.2007, AvH. Wadi Midaq, 1 ex., 17–24.v.2006, LT, AvH. Wadi Safad, 3 ex., 31.i–21.ii.2006, 15–22.iv.2006, all LT, AvH. Wadi Wurayah farm, 3 ex., 15.i–22.ii.2009, 22.ii–2.iii.2009, all LT, AvH.

Length: 3.5–4 mm.

Remarks: Gillett & Gillett (2002) listed this species from Marawah Island as *Cataphronetis subclavata*. Halophilous species.

Distribution: Egypt, Arabian Peninsula.

***Praeugena gagatina* (Mäklin, 1863)**

Plate 53

Specimens examined: Al-Ajban, 6 ex., 6–22.v.2006, all LT, AvH. Sharjah Desert Park, 9 ex., 29.iii–6.iv.2006, 6–13.iv.2005, 13–23.iv.2005, 13–21.v.2007, all LT, AvH.

Length: About 12.5 mm.

Remarks: Arboreal species.

Distribution: Senegal, Ethiopia, Sudan, Chad, Somalia, Arabian Peninsula. New to the UAE.

***Scleropatroides strigatum* (Fabricius, 1798)**

Plate 54

Specimens examined: Fujairah, 72 ex., 16–24.ii.2005, 5.iii–6.iv.2005, 6.iv–2.v.2005, 5.vi–2.vii.2005, 13.xi.–10.xii.2005, 15–22.iv.2006, all LT, AvH. Ra's al-Khaimah airport, Ghaf forest, 5 ex., 27.ix.2007, at light, JB & HP. Sharjah Desert Park, 9 ex., 14.x.2004, 6–30.iv.2005, 25.ii–25.iii.2006, 6–28.xii.2006, all LT, AvH.

Length: About 5 mm.

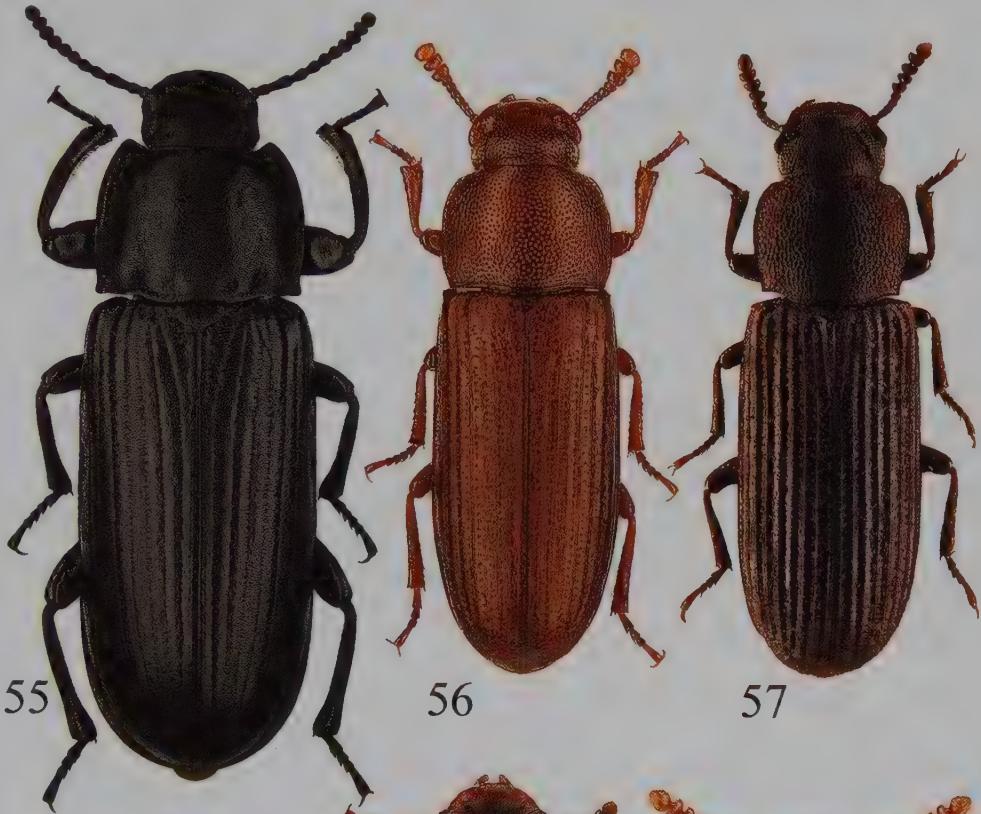
Remarks: Firstly recorded from the Arabian Peninsula (Oman) by Ferrer (2000).

Distribution: S India, Sri Lanka, Arabian Peninsula. New to the UAE.



Plates 49–54. 49: *Opatroides vicinus* (Fairmaire, about 8.5 mm); 50: *Palorus fisticola* (Wollaston), about 2.5 mm; 51: *Palorus subdepressus* (Wollaston), about 3 mm; 52: *Phtora subclavata* (Wollaston), 3.5–4 mm; 53: *Praeugena gagatina* (Mäklin), about 12.5 mm; 54: *Scleropatroides strigatum* (Fabricius), about 5 mm.

- Sclerum evansi*** Blair, 1923 Plate 18
 Specimens examined: Um al-Quwain, 4 ex., 1–30.xi.2008, PT, AvH.
 Length: 6–7 mm.
 Remarks: The species identification of this series is preliminary, because this genus needs a taxonomic revision.
 Distribution: Iran, Iraq, Arabian Peninsula. New to the UAE.
- Tenebrio molitor*** Linnaeus, 1758 Plate 55
 Specimens examined: NARC, near Sweihan, 1 ex., 14.iii–2.iv.2005, LT, AvH.
 Length: 13–15 mm.
 Remarks: Synanthropic species. The larvae of this species are widely bred in the UAE to feed birds.
 Distribution: Cosmopolitan.
- Tribolium castaneum*** (Herbst, 1797) Plate 56
 Specimens examined: Hatta, 5 ex., 8–26.iv.2006, LT, AvH. Sharjah, 10 ex., iii.2008, in wheat flour, leg. N. van Harten. Sharjah-Khor Kalba, near tunnel, 1 ex., 26.iv–03.v.2006, LT, AvH.
 Length: About 3.5 mm.
 Remarks: Synanthropic species.
 Distribution: Cosmopolitan.
- Tribolium indicum*** Blair, 1930 Plate 57
 Specimens examined: Fujairah, 1 ex., 20–27.v.2006, LT, AvH. Near Mahafiz, 1 ex., 21–28.iii.2006, LT, AvH. Wadi Safad, 2 ex., 20.xii.2005–2.i.2006, 15–22.iv.2006, all LT, AvH.
 Length: About 4 mm.
 Remarks: First recorded from the Arabian Peninsula (Saudi Arabia) by Schawaller (1993).
 Distribution: India, Arabian Peninsula, widespread in Africa. New to the UAE.
- Subfamily **Diaperinae** Latreille, 1802
- Arabcyneus bremeri*** Schawaller, 2009 Plate 59
 Specimens examined: Fujairah, holotype, 5.vi–2.vii.2005, LT, AvH. Paratypes: 1 ex., same data as holotype. Fujairah, 3 ex., 2.v–5.vi.2005, LT, AvH; 1 ex., 15–22.iv.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 2 ex., 24–30.v.2006, LT, AvH. Wadi Maidaq, 2 ex., 27.iv–4.v.2006, LT, AvH. Sharjah Desert Park, 2 ex., 29.iii–6.iv.2005, LT, AvH; 7 ex., 6–30.iv.2005, LT, AvH; 9 ex., 30.iv–31.v.2005, LT, AvH; 1 ex., 30.vi–21.vii.2005, LT, AvH; 2 ex., 21.vii–5.viii.2005, LT, AvH. OMAN: Sayq, 540 m, 1 ex., 5–6.vii.1995, leg. M.D. Gallagher. Qurm Nature Reserve, 1 ex., 26.iv.1984, leg. M.D. Gallagher. N of Sama II Quylah, 400 m, 6 ex., 22.iv.1985, leg. C. Holzschuh. Additional specimens examined: Sharjah Desert Park, 2 ex., 1–8.iv.2007, LT, AvH; 3 ex., 6–30.iv.2008, LT, AvH; 2 ex., 4.viii–4.ix.2008, LT, AvH.
 Length: About 5 mm.
 Remarks: Described recently in a separate paper (Schawaller, 2009). Unfortunately, in that publication some locality data have been confused ("Wadi Wurayah, Fujairah", correct "Fujairah", and "Wadi Wurayah, Sharjah Desert Park", correct "Sharjah Desert Park").
 Distribution: Oman, UAE.
- Myrmecixenus vaporariorum*** Guérin, 1843 Plate 60
 Specimens examined: Fujairah, 6 ex., 16–24.ii.2005, LT, AvH. Hatta, 2 ex., 24–30.v.2006, LT, AvH. Sharjah Desert Park, 12 ex., 6–30.iv.2005, 30.vi–21.vii.2005, 21.vii–5.viii.2005, all LT, AvH.
 Length: About 2 mm.



Plates 55–60. 55: *Tenebrio molitor* Linnaeus, 13–15 mm; 56: *Tribolium castaneum* (Herbst), about 3.5 mm; 57: *Tribolium indicum* Blair, about 4 mm; 58: *Paramellon* spec., about 2.5 mm; 59: *Arabcynaeus bremeri* Schawaller, about 5 mm; 60: *Myrmecixenus vaporariorum* Guérin, about 2 mm.

Remarks: Kaszab (1981, 1982, 1986) in his revision of the Arabian tenebrionids did not deal with this genus, probably because at that time this genus was still classified in the traditional sense under the 'Colydidae'. Synanthropic species, preferably in compost-heaps.

Distribution: Cosmopolitan (?). New to the Arabian Peninsula.

***Pseudoseriscius maculosus* Fairmaire, 1871**

Plate 17

Specimens examined: Um al-Quwain, 3 ex, 1–30.xi.2008, PT, AvH.

Length: About 5 mm.

Distribution: Egypt, Near East, Saudi Arabia, Iran. New to the UAE.

Subfamily Cossyphodinae Wasmann, 1899

***Paramellon* spec.**

Plate 58

Specimens examined: Sharjah Desert Park, 1♀, 20.x–24.xi.2007, LT, AvH.

Length: About 2.5 mm.

Remarks: This is the first record of the subfamily Cossyphodinae on the Arabian Peninsula and probably a new species. I refrain from describing this species on the base of a single female. The genus is known from India, Socotra and tropical Africa, and the congeners are associated with ants.

Distribution: Unknown.

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First of all I want to thank Tony van Harten (Sharjah) for the possibility to study this interesting material and for receiving a great number of duplicate specimens for the collections of the Natural History Museum in Stuttgart, Germany. Substantial additional collections made in the Emirates were made by Jan Batelka (Prague) and Hynek Pinda (Prague/Dubai) and kindly submitted to the author for study. Jan Batelka also kindly checked an earlier draft of the manuscript and provided valuable corrections and additions. The hospitality during several visits for comparative studies in Budapest (Dr. Ottó Merkl) and London (Max Barclay) is greatly appreciated. Last but not least I thank my colleague Johannes Reibnitz (Stuttgart) who did again a great job with preparing and arranging the photographs.

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Annex 1–2. Live specimens of two common Tenebrionidae. 1 (top): *Adesmia cancellata clathrata* Solier, in copula, Wadi Bih dam (photograph by M. Jaschhof); 2: *Thriptera kraatzi* Haag-Rutenberg (photograph by M. Hauser).



Order Coleoptera, family Cerambycidae (Part 2)

Jan Batelka

INTRODUCTION

Twelve species of Cerambycidae have so far been reported from the UAE (Sama, 2008). Here new localities and one species new for the fauna of the UAE are recorded, the description of the female of *Iranobrium buettikeri* Holzschuh, 1993, is provided for the first time, and one new synonymy is proposed. Host-plants for four native cerambycid species are recorded based on personal observations.

MATERIALS AND METHODS

The photographs were taken using an Olympus Camedia C-5060 digital camera attached to an Olympus SZX9 binocular microscope. Differently focused images were combined using Helicon Focus 3.20.2.Pro software.

The specimens dealt with are deposited in the following collections in the Czech Republic: Jan Batelka collection, Praha, National Museum, Praha, and Institute of Entomology AV ČR, České Budějovice, Petr Švácha collection. Abbreviations used in the text: JB = leg. J. Batelka, HP = leg. H. Pinda.

SYSTEMATIC ACCOUNT

Subfamily Prioninae Latreille, 1802

Anthracocentrus arabicus (Thomson, 1877)

Specimens examined: Dubai, env. Margham, 24°55'N 55°38'E, 163 m, 4 ex., 24.ix–4.x.2007, JB & HP. Dubai, env. Tawi Al Faqa, 24°38'N 55°31'E, 221 m, 2 ex., 2.x.2007, JB & HP.

Remarks: Four larvae were dissected from the moist dead wood of underground part of *Prosopis cineraria* stump in Margham (P. Švácha det.). The wood was very dark and infected by termites.

Subfamily Cerambycinae Latreille, 1802

Derolus iranensis arabicus Sama, 2008

Specimens examined: Wadi Hayl, 225 m, 1♂, 22.ix.2007, emerged ex larva on 18.i.2008, numerous larvae in dead twigs of *Ficus cordata salicifolia*, JB & HP. Wadi Wurayah, 210 m, 1♂, 25.iii.2007, emerged on 19.i.2008 ex larva reared from dead twig of *Nerium oleander*, JB.

Remarks: In addition to the male reared from *Nerium* collected near the waterfall in Wadi Wurayah, many larvae and exit holes were observed (JB) in dead twigs of the same plant, also in the localities Wadi Fara (env. al-Ghail) and Wadi Hayl. Characteristic *Derolus* borings and one praepupa in the pupal chamber with white calcareous operculum were observed in dry branches of *Ficus johannis* in Ru'us al-Jibal, a plateau below Jebel Jibir (ca. 600 m, 29.ix.2007, JB & HP). Sama (2008) found one larva of *Derolus* spec. in *Euphorbia larica*. Apparently polyphagous species, predominantly on *Calotropis procera* in open sandy desert, where it decimates large growths of this shrub. In the mountains, where *Calotropis* is extremely rare or missing, it attacks some other shrubs and trees like *Euphorbia*, *Nerium* and *Ficus* spp.

Iranobrium buettikeri Holzschuh, 1993

Plates 1–2

Specimens examined: Ra's al-Khaimah, env. International Airport, Ghaf forest, 1♂, 2♀, 27.ix.2007, JB & HP.

Descriptive notes: Elytra distinctly abbreviated in the male, $2.2 \times$ as long as their width at humeri and $2.8 \times$ as long as pronotum from the base to the apex. Holzschuh (1993) reported in his specimens elytra $2.1 \times$ as long as their width at humeri, but this small difference could be accepted within the range of the variability or calculation error. Female similar to male. Antennae only slightly longer than elytra, outer side of 8th–10th antennomeres angular at apex, 11th antennomere one-side beveled apically. Antennomere length ratios: 6.0:1.0:3.9:4.2:5.8:5.0:4.5:3.5:2.9:2.8:3.8. Elytra fully developed, $3.1 \times$ as long as the pronotum, almost transparent, sparsely, irregularly but deeply punctuate, apex finely rugose with almost no punctuation. In the male of *Iranobrium davatchii* Villiers, 1967, mentioned below elytra are not abbreviated, covering the whole abdomen, $2.6 \times$ as long as their width at humeri and $3.5 \times$ as long as the pronotum from the base to the apex.

Length: 5.0–5.5 mm.

Distribution: Species known only from the type series of 20 males from Saudi Arabia; first record from the UAE. Female is here described and figured for the first time.

Iranobrium davatchii Villiers, 1967

Specimens examined: Sharjah, 1♂, 28.iii.2007, imago in a dead twig of *Ziziphus spina-christi* in garden, JB.

Jabusea hammerschmidtii Reiche, 1877

Specimens examined: Abu Dhabi, Sport City, 1 ex., 4.v.2007, hand-collected, leg. Jan Riegert jr.

Mourgliana vanharteni Sama, 2006

Specimens examined: Wadi Hayl, 225 m, 14 ex., 5.x.2007, at light, JB & HP.

Remarks: Described and known from the type series from the UAE (Sama, 2006, December, not dated in journal). Another species, *Mourgliana mollina*, was described upon the basis of one male from Oman by Holzschuh (2006, published on December 22nd according to the journal). Based on the description and picture given by Holzschuh (2006), I regard *M. mollina* to be identical with *M. vanharteni*. As both names have been published within the same month, in accordance with Article 21.3.1. of the International Code of Zoological Nomenclature (ICZN, 1999), I decide not to formally propose junior synonymy until the exact dates of publication will be verified.

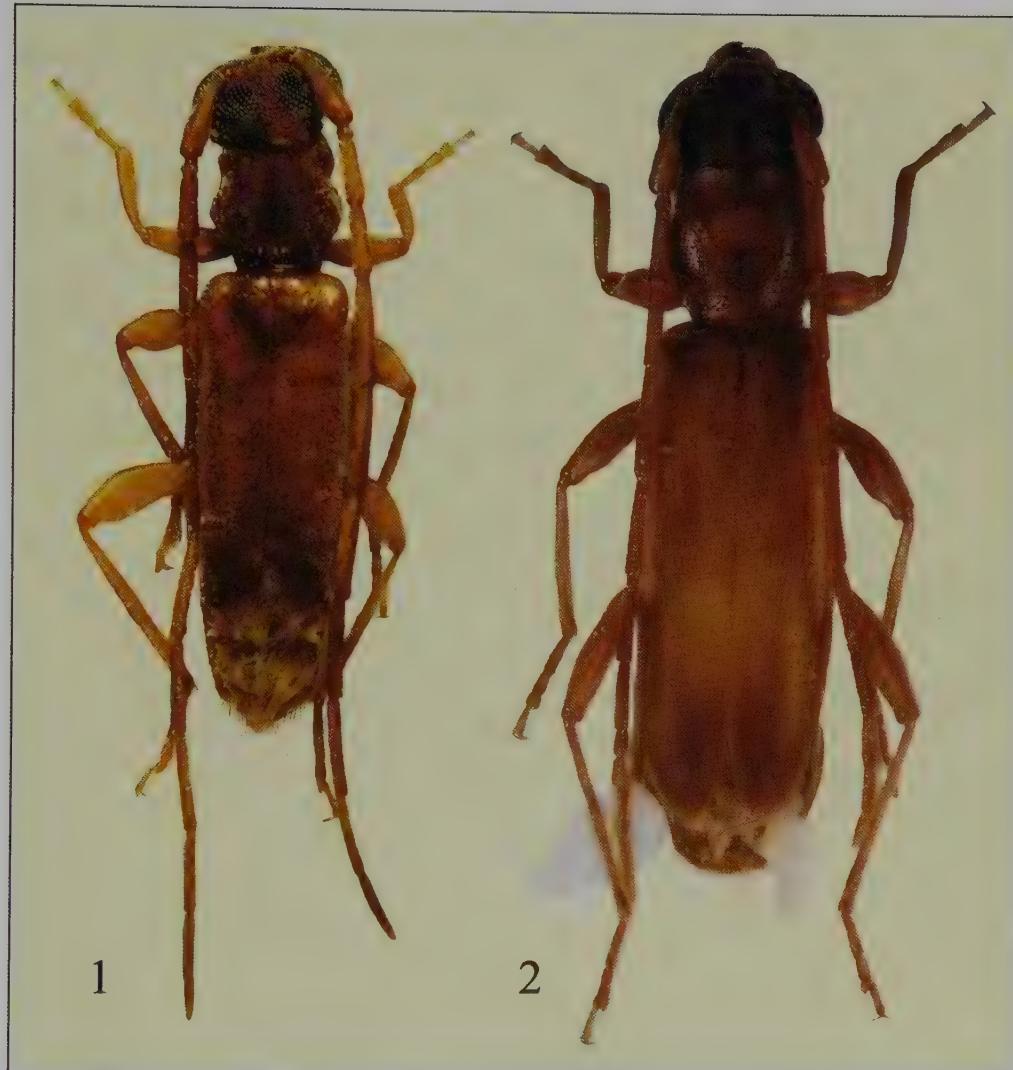
Zoodes compressus (Fabricius, 1787)

Specimens examined: Dubai, env. Margham, 24°55'N 55°38'E, 163 m, 20♂, 4♀, 24.ix–4.x.2007, at night on *Prosopis cineraria*, JB & HP. Ra's al-Khaimah, env. Intl. Airport, Ghaf forest, 4♂, 27.ix. 2007, at night on trees *P. cineraria*, JB & HP.

Remarks: Two females were observed laying eggs into the bark of old standing trees of *P. cineraria*, which represents undoubtedly its host plant. Probably native species of *Prosopis* clusters.

ACKNOWLEDGEMENTS

I gratefully acknowledge Tony van Harten (Sharjah) for his support of my research in the UAE and to Hynek Pinda (Praha, Czech Republic / Dubai, UAE), who kindly sponsored my collecting trips, for his collecting effort and hospitality during my stay in the country.



Plates 1-2. *Iranobrium buettikeri* Holzschuh. 1: Male; 2: Female.

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Order Neuroptera, family Coniopterygidae

György Sziráki

INTRODUCTION

In Meinander's first monograph on the Coniopterygidae (Meinander, 1972) no data from the Arabian Peninsula were included. In the 1970s, 14 species were reported from here (Meinander, 1977, 1979), some of them newly described. Later, as a result of the work of Sziráki (1992, 1997), Monserrat (1995, 1996), Meinander (1998) and Sziráki & van Harten (2006) this number increased to 62. However, hitherto no coniopterygid was known from the United Arab Emirates. In the present paper 22 species from this country are dealt with. Three of them are new to the science and one (*Semidalis aleurodiformis*) is new to the Arabian Peninsula. All others have been keyed in Sziráki & van Harten (2006).

MATERIALS AND METHODS

All examined specimens were collected in the UAE, unless otherwise stated, by Antonius van Harten. The dusty lacewings were caught mainly with Malaise traps and light traps which were operated in different parts of the country.

As regards the male terminalia, we follow the terminology used by Meinander (1972), with a few alterations signed in the text. The holotypes of the new species are deposited in the Hungarian Natural History Museum. All other material – including the paratypes – is divided between the UAE Invertebrate Collection and the collection of HNHM.

Abbreviations used in the text: AL = at light; AS = Anitha Saji; AvH = Antonius van Harten; HC = hand collecting; HNHM = Hungarian Natural History Museum; LT = light trap; MT = Malaise trap; NARC = National Avian Research Centre; WT = water trap.

SYSTEMATIC ACCOUNT

Subfamily Aleuropteryginae Enderlein, 1905

Aleuropteryx arabica Meinander, 1977

Specimens examined: Wadi Safad, 12♂, 20.xii.2005–2.i.2006, LT.

Diagnosis: Small, dark pigmented species. Fore wing 1.5–1.7 mm, with dark brownish gray colour, and forked vein Cu₂. In male genitalia the ninth sternite with a long, narrow ventral process.

Distribution: Saudi Arabia, Yemen, Oman and Tanzania. New to the UAE.

Aleuropteryx mayri Sziráki nov. spec.

Figures 1–4

Specimens examined: Holotype: ♂, United Arab Emirates, Fujairah [25°08'N 56°21'E], 6.iv–2.v.2005, LT, leg. A. van Harten. Paratypes: 1♂, Fujairah, 2.v–5.vi.2005, LT. 13♂, Wadi Safad, 20.xii.2005–2.i.2006, LT.

Description: Head dark brown or black, eyes very large, black. Antennae 1.2–1.3 mm, 22–24 segmented. Scape and pedicel dark brown, basal part of flagellum light, apical part dark brown. Palpi medium brown. Prothorax light brown, other parts of thorax dorsally dark brown. Legs dark brown. Length of fore wing 1.6–2.1, of hind wing 1.3–1.8 mm. Membrane of fore wing dark brown, along the distal edge almost black, but at the cross veins and the

endings of longitudinal veins hyaline. Hind wing very light brown. Vein Cu₂ of fore wing unforked.

Male genitalia (Figs 1–4): Lateral part of ninth sternite strong; proximal apodeme in ventral view laterally narrow. Ventral process is very long, and in lateral view rather broad and curved. A pair of ventro-lateral projections with conical ending situated between the lateral parts and ventral process of ninth sternite. Dorso-caudal appendage of ninth segment mostly membranous proximally, but strongly sclerotized and forked distally, with hairless dorsal part (= ‘transverse plate’ according to Meinander (1972)), and with setose ventral part. Penis very long and acute; its apodemes small. Dorsal plate large; its caudal edge in ventral or dorsal view wide u-shaped.

It is worth mentioning that, agreeing with Tjeder (1957), the paired dorso-caudal appendage of ninth segment (= appendage of ninth sternite in Meinander (1972)) probably is homologous with the paramere of some other coniopterygid genera.

Remarks: *Aleuropteryx mayri* is close to *A. vartianorum* Aspöck & Aspöck. The main distinctive features of the new species are:

- the dark pigmentation of the head and fore wing,
- the very long, and in lateral view broad ventral process of the ninth sternite,
- presence of a pair of ventro-lateral projections with conical ending in male genitalia.

Etymology: This species is named in honour of Ernst Mayr, the outstanding evolutionary biologist who began his career as successfull collector and fruitful taxonomist, and who died in 2005 at 100 years of age.

Aleuropteryx vartianorum H. Aspöck & U. Aspöck, 1967

Specimens examined: Al-Ajban, 2♂, 10–17.x.2005, LT; 1♂, 10–17.x.2005, MT & LT. Al-Aslab, 3♂, 19.ix.2004, AL. Bu Haza, 6♂, 28.iv.2005, leg. C. Drew. Shah, 6♂, 25.iv.2005, leg. AS. Near Mahafiz, 2♂, 23.iv.2005, AL & LT, leg AvH & K. Szpila. Sharjah Desert Park, 1♂, 9.iii–21.iii.2005, LT; 1♂, 21.iii–29.iii.2005, LT; 1♂, 29.iii–6.iv.2005, LT; 1♂, 6–30.iv.2005, LT; 1♂, 30.iv–31.v.2005, LT; 7♂, 30.v–30.vi.2005, LT; 3♂, 30.vi–21.vii.2005, LT; 4♂, 21.vii–5.viii.2005.

Diagnosis: A rather small, light pigmented species. Fore wing 1.5–2.2 mm, with yellowish brown colour, and unforked vein Cu₂. In male genitalia the ninth sternite does not have a widened caudal lobe, while its elongated dorsal plate terminates in two thin, slightly bent projections.

Distribution: Saudi Arabia, Oman and Pakistan. New to the UAE.

Aleuropteryx wawrikiae Rausch & H. Aspöck, 1978

Specimen examined: Wadi Safad, 1♂, 20.xii.2005–2.i.2006, LT.

Diagnosis: A rather dark pigmented species. Fore wing 1.5–2.4 mm, with greyish brown colour, and unforked vein Cu₂. In male genitalia the ninth sternite has widely rounded caudal lobe, and a broad dorsal plate.

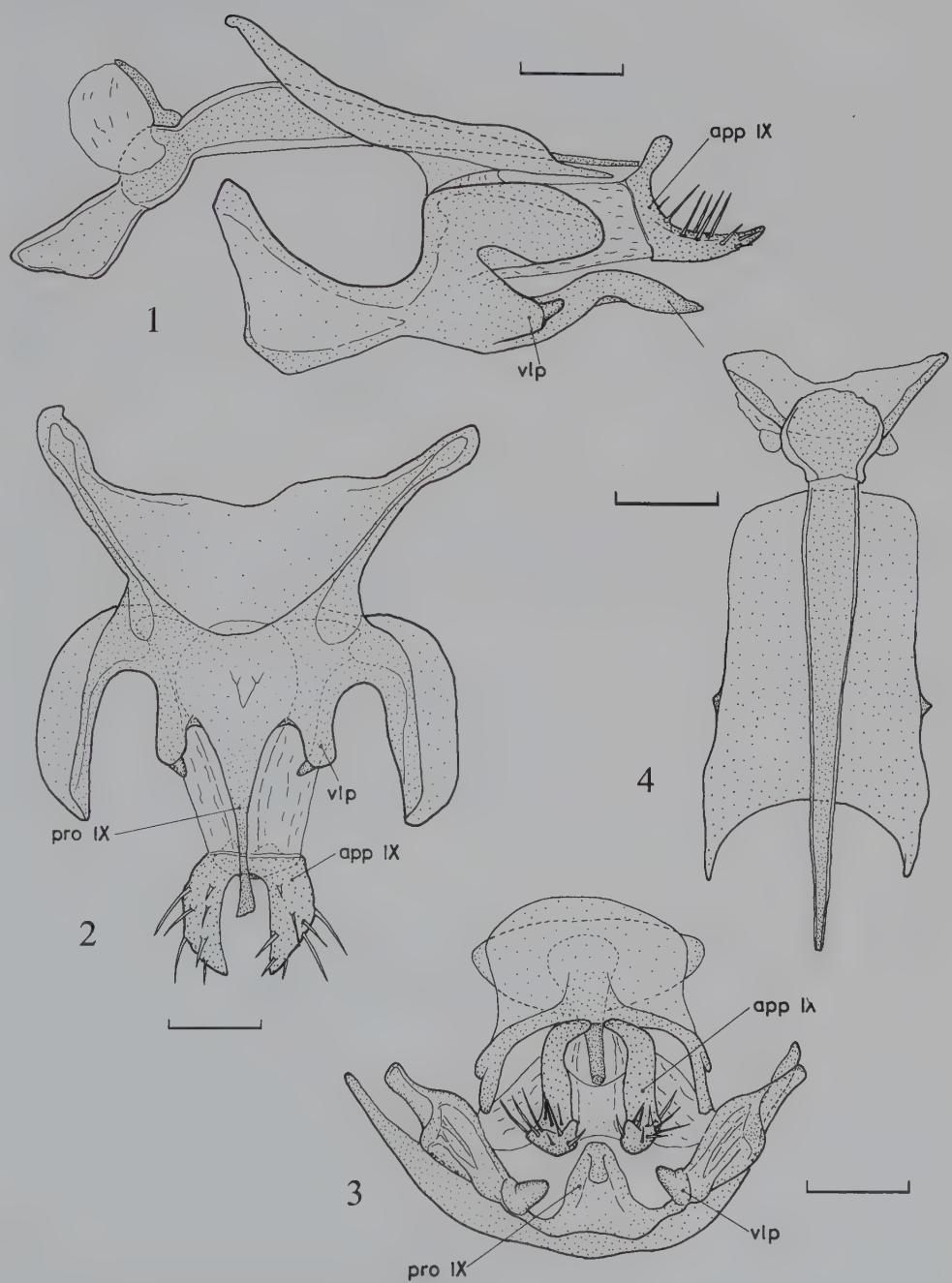
Distribution: Yemen and Morocco. New to the UAE.

Aleuropteryx spp.

27 female specimens from 10 samples, probably belonging to more than one species, have been found in the examined material. At present their exact identification to species level is impossible.

Helicoconis spec.

Specimen examined: Wadi Safad, 1♀, 20.xii.2005–2.i.2006, LT.



Figures 1–4. *Aleuropteryx mayri* nov. spec. 1: Male genitalia, lateral view; 2: Male genitalia without penis and dorsal plate, ventral view; 3: Male genitalia, caudal view; 4: Penis and dorsal plate, ventral view. Abbreviations: app IX = dorso-caudal appendage of ninth segment, pro IX = ventral process of ninth sternite, vlp = ventro-lateral projection. Scale bars = 0.07 mm.

Remarks: At present its exact identification to species level is impossible, however, this finding shows the presence of the genus *Helicoconis* Enderlein, 1905, in the UAE.

Subfamily **Coniopteryginae** Burmeister, 1839

Nimboa espanoli Ohm, 1973

Specimens examined: Al-Ajban, 1♂, 9.xi–7.xii.2005, LT & MT. Fujairah, 8♂, 5.iii–6.iv.2005, LT; 5♂, 2.v–5.vi.2005, LT; 1♂, 5.vi–2.vii.2005, LT. Sharjah, 2♂, 11–17.x.2004, AL; 4♂, 12–28.vi.2005, LT. Sharjah Desert Park, 1♂, 22.ii–9.iii.2005, LT; 1♂, 21.iii–29.iii.2005, LT; 2♂, 29.iii–6.iv.2005, LT; 3♂, 30.iv–31.v.2005, LT; 6♂, 30.v–30.vi.2005, LT; 1♂, 21.vii–5.viii.2005, LT. Wadi Safad, 1♂, 20.xii.2005–2.i.2006.

Diagnosis: Wing membrane unspotted. Length of fore wing 2.2–2.5 mm. Caudal edge of hypandrium with small median incision. Fused caudal part of parameres long, narrow, its end rounded. Dorsal arch of parameres absent.

Distribution: Spain, Canary Islands, Morocco, Mali, Nigeria, South Africa, Yemen. New to the UAE.

Nimboa macroptera Aspöck & Aspöck, 1965

Specimens examined: Al-Ajban, 1♂, 10–17.x.2005, LT; 1♂, 17.x–9.xi.2005, LT; 1♂, 10–17.x.2005, LT & MT; 2♂, 9.xi–7.xii.2005, LT & MT. Al-Aslab, 1♂, 19.ix.2004, AL. Sharjah Desert Park, 1♂, 14.x.2004, AL & HC; 2♂, 10.xi.2004, AL; 14♂, 25.i–22.ii.2005, LT; 4♂, 22.ii–9.iii.2005, LT; 1♂, 9.iii–21.iii.2005; 7♂, 29.iii–6.iv.2005, LT; 19♂, 6–30.iv.2005, LT; 35♂, 30.iv–31.v.2005, LT; 27♂, 30.v–30.vi.2005, LT; 1♂, 30.vi–21.vii.2005, LT; 9♂, 21.vii–5.viii.2005, LT. NARC, near Sweihan, 1♂, 4.ii–14.iii.2005, LT; 19♂, 14.iii–2.iv.2005, LT.

Diagnosis: Wing membrane unspotted. Length of fore wing 1.6–3.5 mm. Caudal edge of hypandrium with shallow, often indistinct incision. Fused caudal part of parameres moderately long, narrow, its caudal end narrowly truncate or moderately pointed in dorsal view, distinctly pointed in lateral view. Dorsal arch of parameres prominent.

Distribution: Canary Islands, Greece (Crete), Sudan, Egypt, Saudi Arabia, Yemen, Oman, Lebanon, Iran, Afghanistan. New to the UAE.

Nimboa yemenica Monserrat, 1996

Specimen examined: Sharjah Desert Park, 1♂, 14.x.2004, AL & HC.

Diagnosis: Wing membrane unspotted. Length of fore wing 1.8 mm. Caudal part of hypandrium short, rather weakly sclerotized, without distinct incision. Fused caudal part of parameres short, pointed. Dorsal arch of parameres large, in lateral view prominent.

Distribution: Yemen. New to the UAE.

***Nimboa* spp.**

60 female specimens from 13 samples, probably belonging to more than one species, have been found in the examined material. At present their exact identification is impossible to species level.

Coniopteryx (Xeroconiopteryx) aegyptiaca Withycombe, 1924

Specimen examined: Sharjah Desert Park, 1♂, 6–30.iv.2005, LT.

Diagnosis: Scale-like hairs in two whorls on flagellar segments of male antennae. Wing membrane light brown. Length of fore wing 2.0–2.7 mm. Gonarcus short. Processus lateralis, processus terminalis and its median incision small. Styli unforked, band-like below the parameres. Inner branch of the forked processus apicalis with two teeth.

Distribution: Morocco, Egypt, Yemen. New to the UAE.

***Coniopteryx (Xeroconiopteryx) arenicola* Sziráki nov. spec.**

Figures 5–9

Specimens examined: Holotype: ♂, United Arab Emirates, Sharjah Desert Park [25°17'N 55°42'E], 21–29.iii.2005, LT, leg. A. van Harten. Paratypes: 1♂, same data as holotype. 6♂, al-Ajban, 10–17.x.2005, LT; 1♂, 9.xi–7.xii.2005, LT & MT. 1♂, Fujairah, 5.iii–6.iv.2005, LT; 3♂, 6.iv–2.v.2005, LT; 3♂, 5.vi–2.vii.2005, LT. 1♂, Sharjah, 27.iv–5.vi.2005, LT; 3♂, 12–28.vi.2005, LT. 4♂, Sharjah Desert Park, 4–8.xii.2004, WT; 1♂, 25.i–22.ii.2005, LT; 3♂, 29.iii–6.iv.2005, LT; 5♂, 6–30.iv.2005, LT; 2♂, 30.iv–31.v.2005, LT; 7♂, 21.vii–5.viii.2005, LT. 2♂, NARC, near Sweihan, 14.iii–2.iv.2005, LT. 4♂, Wadi Safad, 20.xii.2005–2.i.2006, LT.

Description: Head capsule pale ochreous or light brown, eyes moderately large, black. Antennae 1–1.5 mm, 24–30 segmented, medium brown. Shape of the antennal segments is rather variable: scape 1.1–1.5 times, pedicel 1.3–1.8 times as long as broad, while median flagellar segments may be somewhat shorter, or even 1.4 times longer than broad. Ordinary hairs in two whorls on flagellar segments, from which the anterior is rather irregular. Setae moderately large. Scale-like hairs situated also in two whorls on male flagellar segments. Colour of palpi and legs medium brown. Thorax pale ochreous, with brown sutures and rather small, dark brown shoulder spots. Length of fore wing 1.4–2.2 mm, of hind wing 1.3–1.9 mm. Wing membrane light brown.

Male genitalia (Figs 5–9): Hypandrium ca 2 times as high as long in lateral view. Processus lateralis blunt, triangular. Processus terminalis short, and curving up distinctly in lateral view. Median incision absent. Caudal spines of processus lateralis distinctly longer than those of processus terminalis. Gonarcus moderately long, and ending in an enlarged, caudally rounded plate. Anterior apodeme of hypandrium ventrally incomplete and curved strongly backwards. Styli unbranched, strongly flattened basally, and form a narrow ventral belt which is curving forwards. Caudal part of paramere directed upwards. In lateral view it is wide, sinuous and apically acute. Processus ventralis of paramere small. Penis in lateral view broad, in ventral view thin. A membranous structure is situated dorsally and laterally of penis, and another large one above the hypandrium.

Remarks: *Coniopteryx (X.) arenicola* is rather close to *C. (X.) obtusa* Withycombe, 1925, known from Pusa (now Samastipur), Bihar, India, with a humid subtropical climate. The main distinctive features of the new species are:

- basally very broad stylus,
- in lateral view broad penis,
- curving upwards of hypandrium
- curving backward of anterior apodeme of hypandrium.

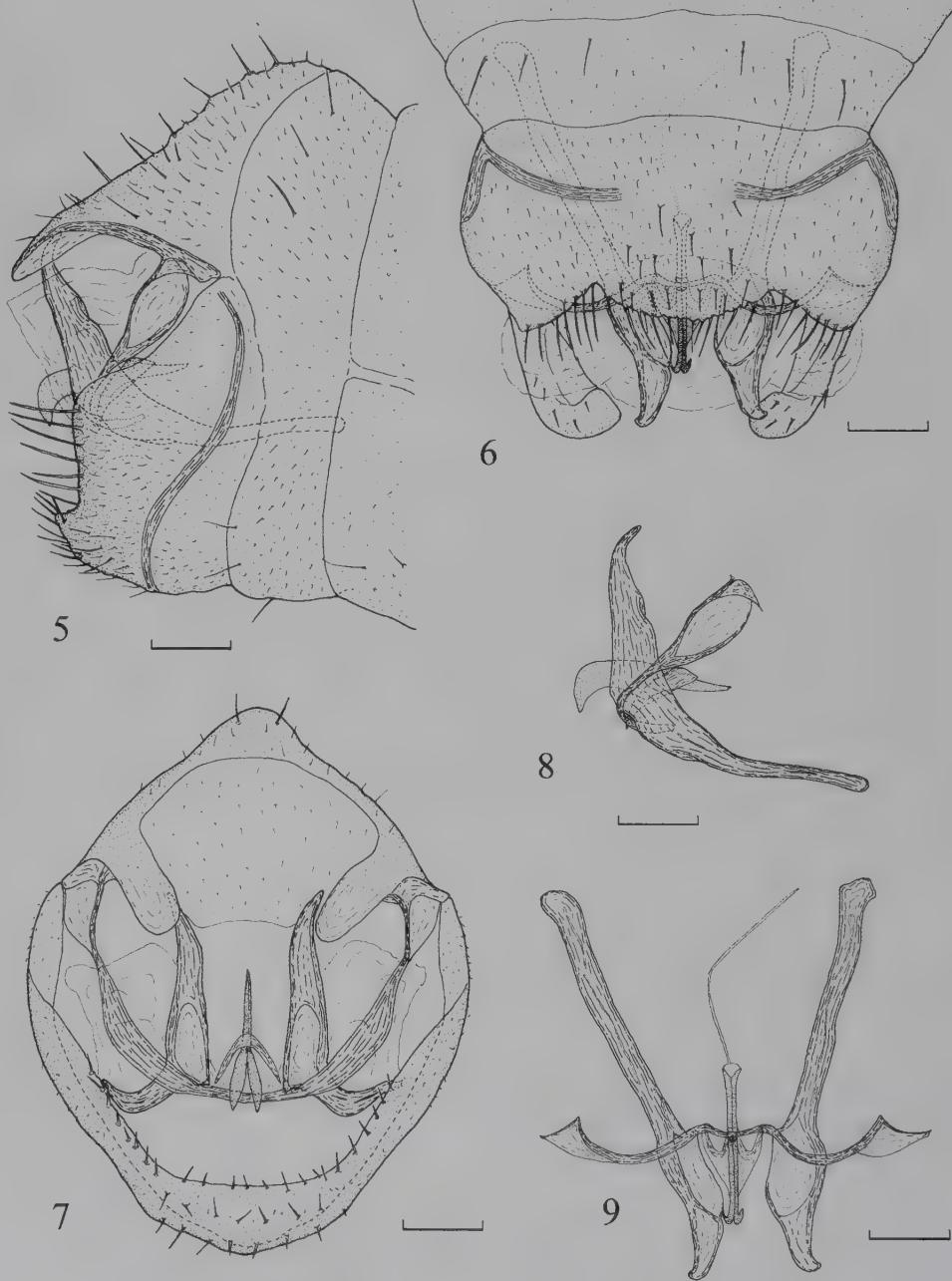
Etymology: The latin ‘arenicola’ means ‘denizen of sands’.

***Coniopteryx (Xeroconiopteryx) deserta* Meinander, 1979**

Plates 1–2

Specimens examined: Abu Saluf, 32♂, 15.v.2008, MT, leg. AS. Al-Ajban, 36♂, 10–17.x.2005, LT & MT; 3♂, 17.x–9.xi.2005, LT; 1♂, 9.xi–7.xii.2005, LT & MT. Fujairah, 11♂, 16–24.ii.2005, LT; 2♂, 24.ii–5.iii.2005, LT; 59♂, 5.iii–6.iv.2005, LT; 31♂, 6.iv–2.v.2005, LT; 81♂, 2.v–5.vi.2005, LT; 44♂, 5.vi–2.vii.2005, LT. Sharjah Desert Park, 31♂, 25.i–22.ii.2005, LT; 24♂, 22.ii–9.iii.2005, LT; 76♂, 21–29.iii.2005, LT; 53♂, 29.iii–6.iv.2005, LT; 177♂, 6–30.iv.2005, LT; 80♂, 30.iv–31.v.2005, LT; 34♂, 30.v–30.vi.2005, LT; 1♂, 30.vi–21.vii.2005, LT; 13♂, 21.vii–5.viii.2005, LT. NARC, near Sweihan, 9♂, 4.ii–14.iii.2005, LT; 26♂, 14.iii–2.iv.2005, LT. Wadi Safad, 7♂, 20.xii.2005–2.i.2006, LT.

Diagnosis: Long and narrow scale-like hairs present in two whorls on the flagellar segments of male antennae. Wing membrane light greyish. Length of fore wing 1.6–1.8 mm. Gonarcus moderately long, subtriangular. Hypandrium very short. Ventral part of processus lateralis prominent but short. Processus terminalis absent. Styli forked; its outer branch represented by a small acute projection, the inner branch very broad and forming an arch below the



Figures 5–9. *Coniopteryx (X.) arenicola* nov. spec. 5: Male genitalia, lateral view; 6: Male genitalia, ventral view; 7: Male genitalia, caudal view; 8: Male internal genitalia, lateral view; 9: Male internal genitalia, ventral view. Scale bars: 0.07 mm.

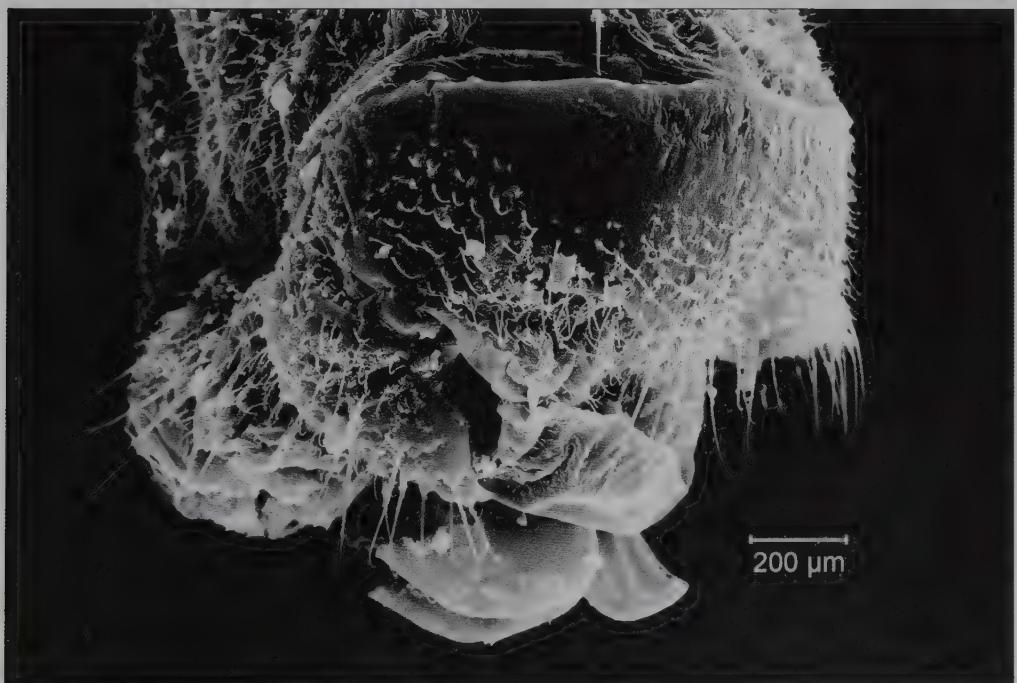
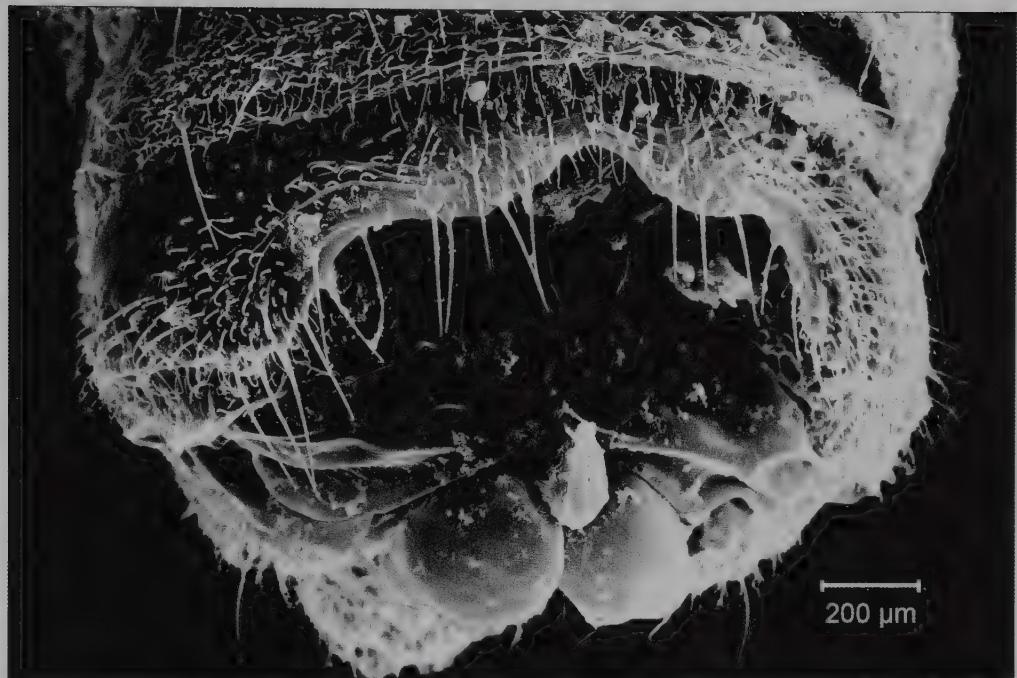


Plate 1–2. *Coniopteryx (X.) deserta* Meinander, male genitalia. 1: Ventral view; 2: Lateral view.
(Scanning photographs made by D. Murányi)

parameres, with a short median apophysis. Processus apicalis of the stout paramere forked, with moderately long, tooth-like inner branch.

Distribution: Saudi Arabia, Yemen. New to the UAE.

***Coniopteryx (Xeroconiopteryx) hastata* Meinander, 1998**

Specimens examined: Fujairah, 1♂, 5.iii–6.iv.2005, LT; 1♂, 6.iv–2.v.2005, LT; 2♂, 2.v–5.vi.2005, LT. Sharjah Desert Park, 1♂, 30.iv–31.v.2005, LT.

Diagnosis: No scale-like hairs on flagellar segments of male antennae. Wing membrane fuscous. Length of fore wing 1.9 mm. Gonarcus basally broad, with a finger-like ventro-caudal, and a wart-like internal projection. Processus lateralis represented by a long, straight thorn, which is supported ventrally by a branched apophysis. Processus terminalis rather indistinct, with very small median incision. Styli unforked, band-like below the parameres. Processus apicalis of paramere forked, with very narrow branches.

Distribution: Iran, Yemen. New to the UAE.

***Coniopteryx (Xeroconiopteryx) martinmeinanderi* Sziráki & van Harten, 2006**

Specimen examined: Sharjah Desert Park, 1♂, 29.iii–6.iv.2005, LT.

Diagnosis: Scale-like hairs in an apical whorl on other flagellar segments of male antennae. Wing membrane light fuscous. Length of fore wing 2.0–2.2 mm. Gonarcus moderately long, rather narrow, bifurcate. Processus lateralis indistinct. Processus terminalis and median incision absent. Styli unforked, forming an arch below the parameres. Dorsally directed processus apicalis of paramere strong, unforked.

Distribution: Palestine, Yemen. New to the UAE.

***Coniopteryx (Xeroconiopteryx) platyarcus* Sziráki & van Harten, 2006**

Plate 3

Specimens examined: Al-Ajban, 6♂, 10–17.x.2005, LT. Fujairah, 3♂, 6.iv–2.v.2005, LT. Sharjah Desert Park, 2♂, 21.iii–29.iii.2005, LT; 5♂, 6–30.iv.2005, LT. Wadi Safad, 4♂, 20.xii.2005–2.i.2006, LT.

Diagnosis: Scale-like hairs mostly in an apical whorl on the flagellar segments, but may be on the basal part of these segments and on pedicel too. Length of fore wing 1.4–2.1 mm, of hind wing 1.3–1.9 mm. Hypandrium with shallow median incision in the rounded processus terminalis. Gonarcus long, with wide, plate-like, at the end pointed internal, and distinct caudal projection.

Remarks: Both internal and caudal projections of hypandrium of the specimens from UAE were distinctly shorter than in the case of the type material from Yemen.

Distribution: Yemen. New to the UAE.

***Coniopteryx (Xeroconiopteryx) ressli* Rausch & H. Aspöck, 1978**

Specimens examined: Fujairah, 2♂, 6.iv–2.v.2005, LT.

Diagnosis: Scale-like hairs in two whorls on pedicel and on flagellar segments of male antennae. Wing membrane light greyish brown. Length of fore wing 2.2–2.6 mm. Gonarcus short, with a prominent caudal tooth, and with a small internal projection. Processus lateralis weakly sclerotized. Processus terminalis rather large, while its median incision small. Styli unforked, band-like below the parameres. Processus apicalis of paramere consists of a dorsal and a pointed ventral branch.

Distribution: Saudi Arabia, Iran; new to the UAE.

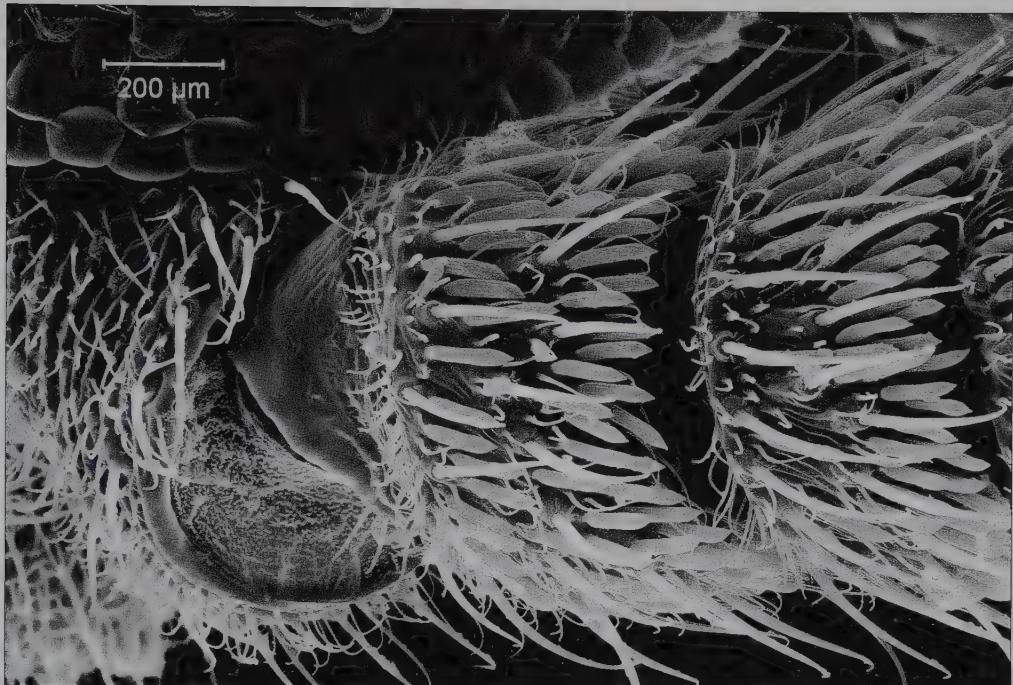


Plate 3. *Coniopteryx (X.) platyarcus* Sziráki & van Harten, pedicel and first flagellar segment of male antenna. (Scanning photograph made by D. Murányi)

***Coniopteryx (Xeroconiopteryx) sanana* Sziráki, 1997**

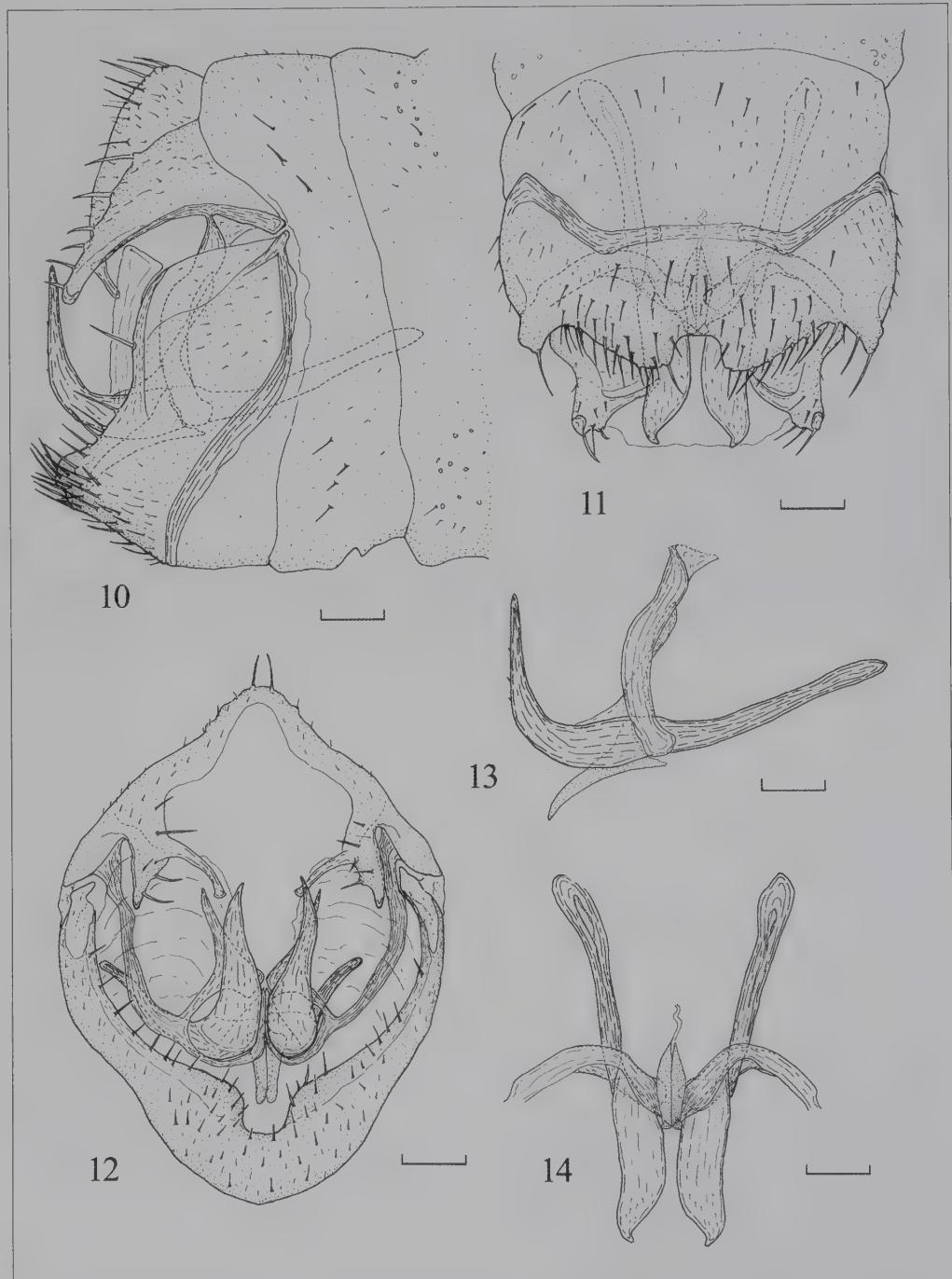
Specimens examined: Abu Saluf, 7♂, 15.v.2008, MT, leg. AS. Al-Ajban, 230♂, 10–17.x.2005, LT & MT; 12♂, 17.x–9.xi.2005, LT; 11♂, 9.xi–7.xii.2005, LT & MT. Fujairah, 1♂, 24.ii–5.iii.2005, LT; 2♂, 6.iv–2.v.2005, LT; 2♂, 2.v–5.vi.2005, LT; 1♂, 5.vi–2.vii.2005, LT. Ruwais, housing area, 1♂, 17.iv.2006, leg. AS. Sharjah Desert Park, 2♂, 14.x.2004, AL & HC; 13♂, 4–8.xii.2004, WT; 4♂, 25.i–22.ii.2005, LT; 5♂, 21–29.iii.2005, LT; 2♂, 29.iii–6.iv.2005, LT; 8♂, 6–30.iv.2005, LT; 6♂, 30.iv–31.v.2005, LT; 2♂, 31.v–30.vi.2005, LT; 2♂, 21.vii–5.viii.2005, LT. NARC, near Sweihan, 3♂, 4.ii–14.iii.2005, LT; 12♂, 14.iii–2.iv.2005, LT. Wadi Safad, 2♂, 20.xii.2005–2.i.2006, LT. Al-Wathba, 5♂, 25.ii.2008, MT, leg. AS.

Diagnosis: Scale-like hairs in two whorls on flagellar segments of male antennae. Wing membrane fuscous brown. Length of fore wing 1.5–2.1 mm. Gonarcus rather long, with a stout, ventrally directed caudal thorn, and with a slightly curved internal projection. Processus lateralis continuing in a plate-like internal projection of hypandrium. Processus terminalis rather large, rounded, with a distinct, u-shaped median incision. Styli unforked, without an arch below parameres. Processus apicalis forked; its posterior branch rounded lance-shaped, while the anterior one large, twisted. Distal part of paramere ventrally supported by a u-shaped sclerite.

Distribution: Yemen. New to the UAE.

***Coniopteryx (Xeroconiopteryx) sweihanica* Sziráki nov. spec.**

Figures 10–14
Specimens examined: Holotype: ♂, United Arab Emirates, NARC, near Sweihan [24°24'N 55°26'E], 14.iii–2.iv.2005, LT, leg. A. van Harten. Paratypes: 3♂, same data as holotype. 2♂, al-Ajban, 9.xi–



Figures 10–14. *Coniopteryx (X.) sweihanica* nov. spec. 10: Male genitalia, lateral view; 11: Male genitalia, ventral view; 12: Male genitalia, caudal view; 13: Male internal genitalia, lateral view; 14: Male internal genitalia, ventral view. Scale bars: 0.07 mm.

7.xii.2005, LT & MT. Sharjah Desert Park, 1♂, 29.iii–6.iv.2005, LT; 2♂, 6–30.iv.2005, LT; 1♂, 30.iv–31.v.2005, LT.

Description: Head capsule mostly light brown, eyes moderately large, black. Antennae 1.1–1.3 mm, 26–29 segmented, brown. Scape and pedicel about 1.5 times as long as broad, not broader than flagellar segments in lateral view. Ordinary hairs in two more or less regular whorls on flagellar segment. Setae moderately large. Scale-like hairs situated also in two whorls on male flagellar segments. Colour of palpi light brown. Thorax pale ochreous, with brown sutures and large, medium brown shoulder spots. Length of fore wing 1.7–2.0 mm, of hind wing 1.5–1.7 mm. Wing membrane light brown.

Male genitalia (Figs 10–14): Hypandrium distinctly higher than long in lateral view. Its anterior apodeme rather weakly sclerotized medially. Processus terminalis broad, with moderately large, u-shaped median incision. Caudal edge of processus lateralis forms a strongly sclerotized, narrow belt. Internal hyaline projection of hypandrium distinct, but rather narrow in lateral view. Gonarcus elongated, with narrow ventral apodeme, and with a long, subapical internal projection. Processus apicalis of paramere long, pointed, and curving upwards approximately in a right angle. Ventral part of stylus branching, and accreted to the paramere. The ventral branch continued in a bent plate dorso-laterally of penis, while the dorsal one forms an acute process, which is hammer-like in caudal view. Penis consists of two parts; it is claw-like in lateral view. In ventral view a small part of ductus ejaculatorius is visible.

Remarks: Because of the structure of gonarcus and hypandrium the *Coniopteryx (X.) sweihanica* is rather close to *C. (X.) sanana* Sziráki. The main distinctive features of the new species are:

- long, curved upwards processus apicalis of paramere,
- special structure of stylus, with large, in caudal view hammer-like dorsal process,
- in lateral view claw-shaped penis,
- strongly sclerotized caudal edge of processus lateralis of hypandrium.

Etymology: This new species was named after the town Sweihan near to the collecting site of its holotype and some paratypes.

Coniopteryx (Xeroconiopteryx) unicef Monserrat, 1996

Plate 4

Specimens examined: Al-Ajban, 4♂, 10–17.x.2005, LT; 2♂, 9.xi–7.xii.2005, LT & MT. Fujairah, 1♂, 24.ii–5.iii.2005, LT; 3♂, 5.iii–6.iv.2005, LT; 2♂, 2.v–5.vi. 2005, LT; 1♂, 5.vi–2.vii.2005, LT. Sharjah, 5♂, 1–31.i.2005, LT; 1♂, 1–10.ii.2005, LT; 2♂, 12–28.vi.2005, LT. Sharjah Desert Park, 2♂, 29.iii–6.iv.2005, LT; 6♂, 6–30.iv.2005, LT; 5♂, 30.iv–31.v.2005, LT. NARC, near Sweihan, 4♂, 14.iii–2.iv.2005, LT. Wadi Safad, 1♂, 20.xii.2005–2.i.2006, LT.

Diagnosis: No scale-like hairs on flagellar segments of male antennae. Wing membrane fuscous. Length of fore wing 1.7–2.1 mm. Gonarcus short, with a strong ventral apophysis ending in a long, downwards directed projection. Processus lateralis represented by a forked projection which is supported ventrally by an apophysis, situated on the dorso-caudal edge of hypandrium. Processus terminalis large, prominent. Median incision deep, u-shaped. Styli unforked, forming a belt below the parameres. Processus apicalis of paramere has a larger dorsal and a smaller ventral projection. Penis long, thin.

Distribution: Iran, Yemen. New to the UAE.

Coniopteryx (Xeroconiopteryx) venustula Rausch & H. Aspöck, 1978

Specimens examined: Abu Saluf, 1♂, 15.v.2008, MT, leg. AS. Al-Wathba, 1♂, 25.ii.2008, MT, leg. AS.

Diagnosis: Scale-like hairs in two whorls on the flagellar segments of male antennae. Wing membrane light brown. Length of fore wing 1.5–2.0 mm. Gonarcus moderately long,

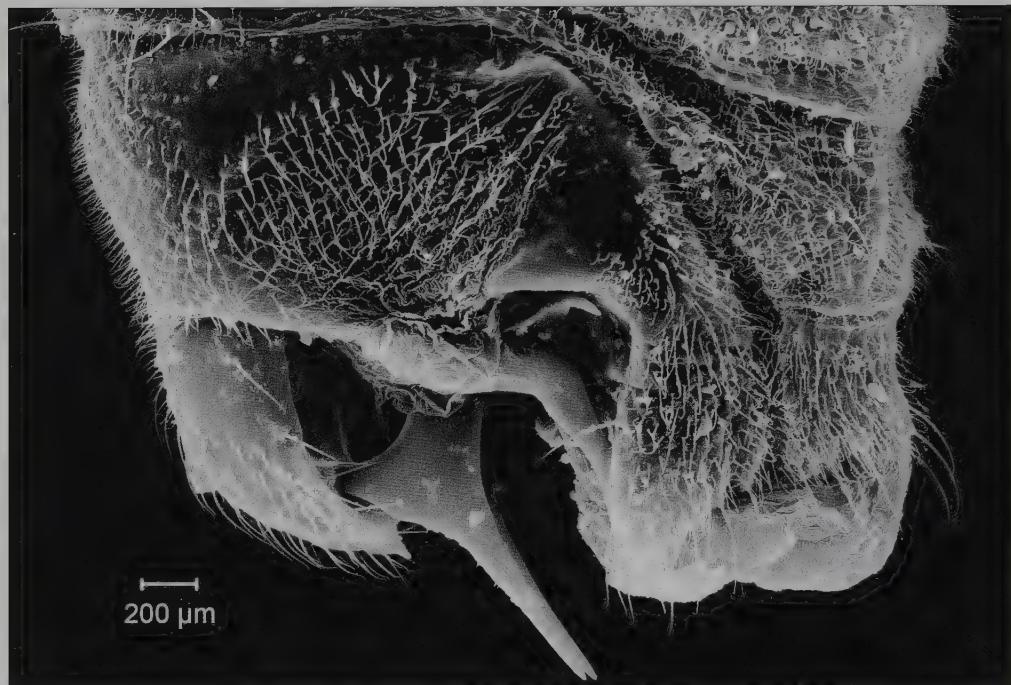


Plate 4. *Coniopteryx (X.) unicef* Monserrat, male genitalia, lateral view. (Scanning photograph made by D. Murányi)

subtriangular. Hypandrium short. Processus lateralis indistinct. Processus terminalis absent, or indistinct. Styli forked; its outer branch short, subtriangular, the inner branch laterally narrow, but forming a broad arch below the slender parameres, with a median apophysis. Processus apicalis of the thin paramere forked with a long, tooth-like inner branch.

Distribution: Yemen, Iran, Sri Lanka. New to the UAE.

Coniopteryx spp.

1368 female specimens from 36 samples, belonging to several species, have been found in the examined material. At present their exact identification is impossible to species level. Besides, 3 males were identified only to genus level because of the incorrect dry preparation, while other 3 male specimens had obviously aberrant, asymmetric genitalia.

Hemisemidalis fulvipennis Sziráki, 1999

Plate 5

Specimens examined: Al-Ajban, 1♂, 9.xi–7.xii.2005, LT & MT. Sharjah Desert Park, 2♂, 25.i–22.ii.2005, LT; 8♂, 22.ii–9.iii.2005, LT; 7♂, 21.iii–29.iii.2005, LT; 8♂, 29.iii–6.iv.2005, LT; 3♂, 6–30.iv.2005, LT; 6♂, 30.iv–31.v.2005, LT; 2♂, 30.v–30.vi. 2005, LT; 2♂, 21.vii–5.viii. 2005, LT. NARC, near Sweihan, 6♂, 4.ii–14.iii.2005, LT; 4♂, 14.iii–2.iv.2005, LT.

Diagnosis: Colour of the body mostly rather dark brown. Wing membrane brownish. Length of the fore wing 2.0–3.0 mm. Anterior apodeme of hypandrium ventrally incomplete. Processus terminalis of hypandrium rounded, short, with shallow median incision. Processus ventralis of paramere distinct, processus apicalis rather long and moderately high.

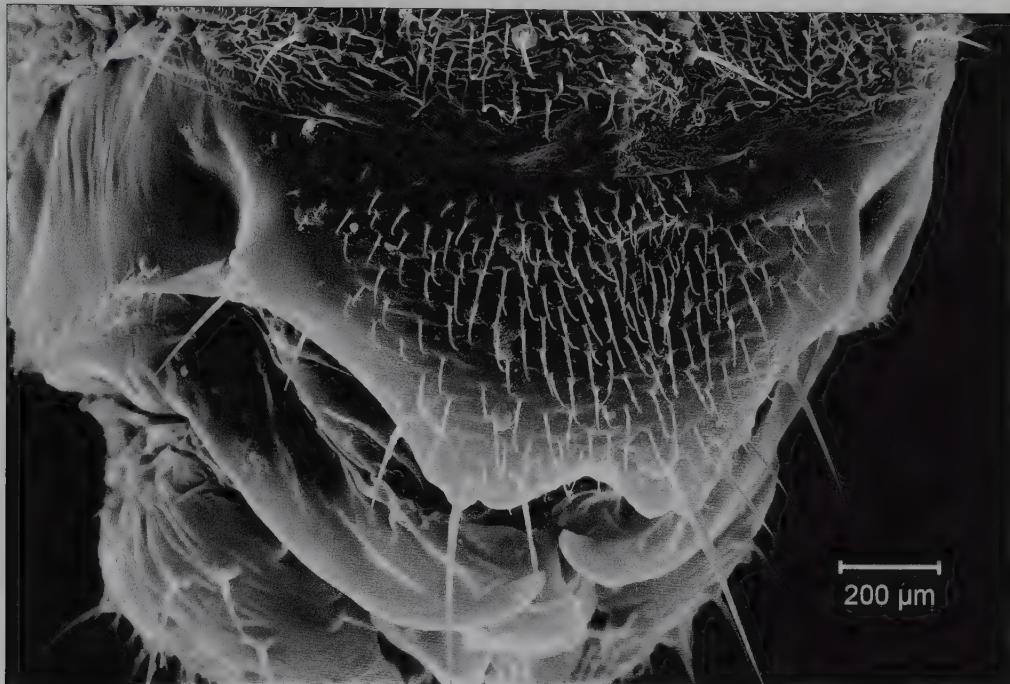


Plate 5. *Hemisemidalis fulvipennis* Sziráki, male genitalia, ventral view. (Scanning photograph made by D. Murányi)

Remarks: Homologization of some parts of male genitalia was given by Sziráki & van Harten (2006).

Distribution: Yemen, Saudi Arabia, Jammu and Kashmir (under administration of Pakistan). New to the UAE.

Hemisemidalis kasyi (Aspöck & Aspöck, 1965)

Specimen examined: Sharjah Desert Park, 1♂, 21.vii–5.viii.2005, LT.

Diagnosis: Colour of the body mostly yellowish in the case of the examined specimen. Wing membrane light yellowish brown. Length of the fore wing 2.2–2.5 mm. Anterior apodeme of hypandrium ventrally incomplete. Processus terminalis rudimentary, widely rounded, without median incision. Processus ventralis of paramere absent, processus apicalis short and high.

Distribution: Iran, Afghanistan, Lebanon, Yemen. New to the UAE.

Hemisemidalis pallida (Withycombe, 1924)

Plate 6

Specimens examined: Al-Ajban, 4♂, 10–17.x.2005, LT; 1♂, 10–17.x.2005, LT & MT. Sharjah Desert Park, 3♂, 29.iii–6.iv.2005, LT; 3♂, 6–30.iv.2005, LT; 7♂, 30.iv–31.v.2005, LT; 6♂, 31.v–30.vi.2005, LT; 1♂, 21.vii–5.viii. 2005, LT. NARC, near Sweihan, 13♂, 4.ii–14.iii.2005, LT; 47♂, 14.iii–2.iv.2005, LT; 1♂, 11–21.v.2005, LT.

Diagnosis: Colour of the body mostly pale ochreous. Wing membrane light greyish. Length of the fore wing 2.8–3.0 mm. Anterior apodeme of hypandrium ventrally incomplete. Processus terminalis protruding, with a dorsal knob in lateral view, with a heavily sclerotized



Plate 6. *Hemisemidalis pallida* (Withycombe), male genitalia, ventral view. (Scanning photograph made by D. Murányi)

belt caudally, and with a very shallow median incision. Processus ventralis of paramere absent, processus apicalis short and moderately high.

Distribution: Spain, Morocco, Algeria, Italy, Greece, Sudan, Egypt, Saudi Arabia, Yemen, Anatolia, Iraq, Iran, Pakistan, Afganistan, Jammu and Kashmir (under administration of Pakistan), Mongolia, Usbekistan, Kazakhstan. New to the UAE.

Hemisemidalis spp.

143 female specimens from 19 samples, probably belonging to more than one species, have been found in the examined material. At present their exact identification is impossible to species level.

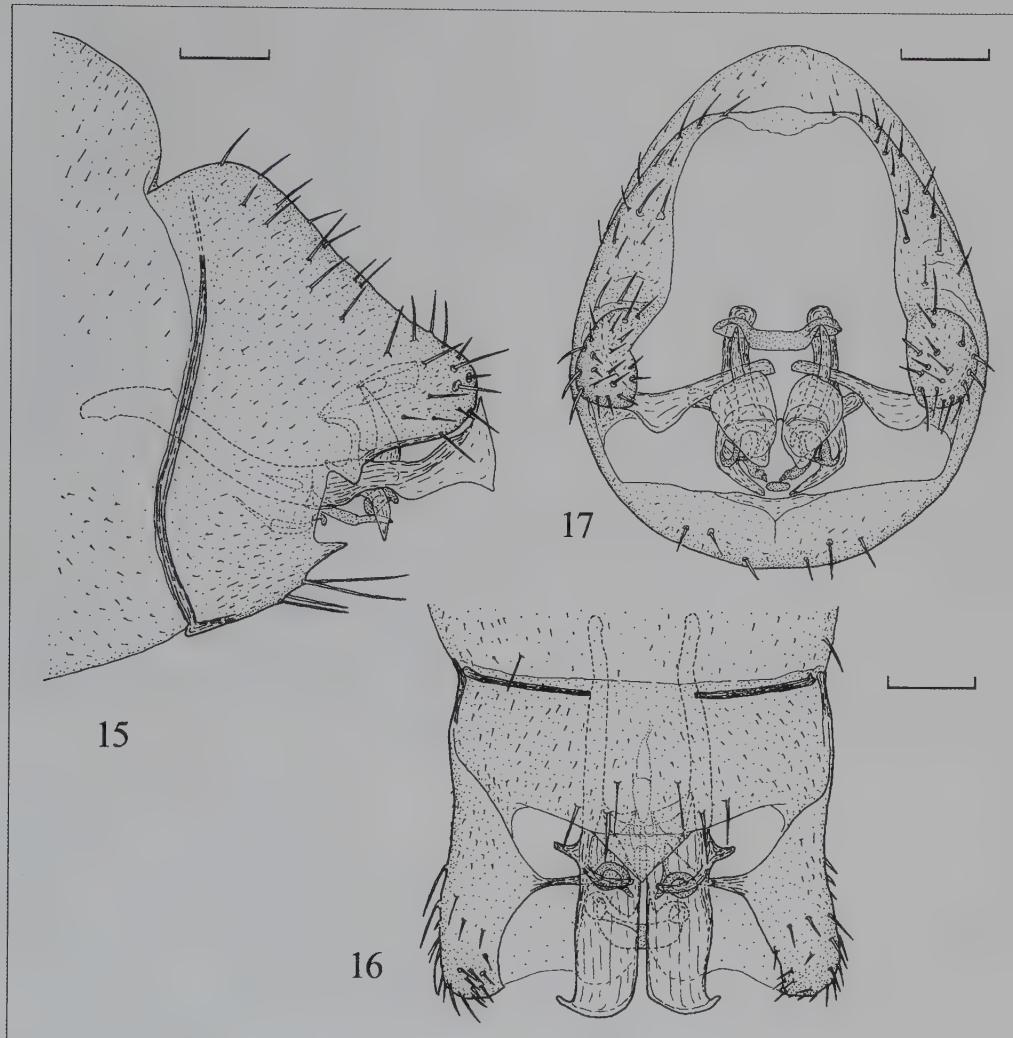
Semidalis aleyrodiformis (Stephens, 1836)

Specimens examined: Fujairah, 1♂, 2.v–5.vi.2005, LT; 2♂, 5.vi–2.vii. 2005, LT. Sharjah, 1♂, 1–31.i.2005, LT.

Diagnosis: Head and thorax brown. Length of fore wing 2.1–3.9 mm, wing membrane almost hyaline. Hypandrium small. Ectoproct moderately long, or short. Distal part of paramere much wider than proximal part, and divided into two hooks.

Remarks: The male genitalia of the examined specimens seems to be close to the specimen from India, figured by Meinander (1972, Figs 200 H–J), rather than to the European populations. Moreover, there are some strong setae on fore femur of the Arab specimens, while such setae hitherto were not reported in the case of European specimens.

Figues 15–17



Figures 15–17. *Semidalis aleyrodiformis* Stephens. 15: Male genitalia, lateral view; 16: Male genitalia, ventral view; 17: Male genitalia, caudal view. Scale bars: 0.07 mm.

Distribution: Large part of Palaearctic and some territories of Oriental Region. New to the Arabian Peninsula and the UAE.

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Order Hymenoptera, family Stephanidae

Alexandre P. Aguiar and John T. Jennings

INTRODUCTION

Even the smallest stephanids are usually quickly recognized as unusual wasps by most people. The family is indeed morphologically peculiar. The head is large and spherical, bearing a crown of five teeth which encircle the anterior ocellum, and is set on a long pronotum which allows the head to move 320°, that is, almost a full circle. The body is long, slender and covered by impressive and varied sculpturing patterns; the fore tibia is centrally compressed and bent outwards, and the hind leg is enormous and highly modified (Plates 1, 15), with five tarsomeres in males, but only three in females, which also bear an ovipositor at least as long as the length of the body. The slender body may appear fragile, but stephanids have one of the highest concentrations of zinc in the mandible and ovipositor, a metal involved in cuticular hardening (Quicke et al., 1998). Stephanids are uncommon or rare, but occur worldwide (Aguiar, 2004), mostly in tropical forests, although quite a few species occur in arid areas (e.g., Benoit, 1984a, 1984b). The efficiency of some collecting techniques for stephanids is discussed by Aguiar & Sharkov (1997). Adults are usually found associated with fallen trees or wood; they are parasitoids of xylophagous larvae, mostly Buprestidae and Cerambycidae (Coleoptera), whose vibrations are detected by subgenual organs in the wasp's fore and hind tibiae (Vilhelmsen et al., 2008).

Stephanidae is currently represented by about 350 valid species, half of which are Oriental, and 12 recent and 3 fossil genera (updated from Aguiar, 2004). Subfamilies have been proposed by several authors, but they are neither precisely nor cladistically defined, and are not adopted here. Van Achterberg (2002) provides the most recent key to genera, but a convincing generic classification still demands intensive work, particularly for the large group of species currently lumped together as *Foenatopus* Smith, 1861.

This is the first record of Stephanidae from the UAE, and the first record of *Foenatopus* from the Arabian Peninsula. The closest location with a similar species is Afghanistan, from where *F. turcomanorum* (Semenow, 1891) has been described. There are only two other stephanid species known from neighbouring regions, namely *Afromegischus gigas* (Schletterer, 1889) from Iran (see Masnadi-Yazdinejad & Lotfalizadeh, 2009), and *A. tibiator* (Schletterer, 1889) from Saudi Arabia, both of which are large wasps, quite distinct from the delicate new species described below from the UAE.

MATERIALS AND METHODS

Terminology, measurements and abbreviations for morphometric ratios were adopted as in Aguiar (2001), which includes wing venation system modified from the Comstock-Needham system after Sharkey & Wharton (1997). Values expressed to the nearest tenth reflect estimated proportions; values expressed to the nearest hundredth were obtained through direct measurements. Images were generated with the EntoVision® extended-focus system (GTVision, Hagerstown, Maryland), illuminated with white LEDs. Observations on colour and sculpturing were made under illumination from a 9W fluorescent desk lamp. Incandescent illumination will not allow observation of colour and structures as described and illustrated here. The holotype female and two male paratypes have been deposited in the Universidade Federal do Espírito Santo Collection (UFES), two male paratypes in the United

Arab Emirates Invertebrate Collection (UAEIC), and two male paratypes in the Waite Insect and Nematode Collection, University of Adelaide (WINC). Label data for all specimens are also available at <http://iris.biosci.ohio-state.edu/projects/stephanids>.

SYSTEMATIC ACCOUNT

Family **Stephanidae** Leach, 1815 (Type genus: *Stephanus* Jurine, 1800).

Genus ***Foenatopus*** Smith, 1861 (Type species: *Stephanus indicus* Westwood, 1841).

***Foenatopus bisignatus* Aguiar & Jennings nov. spec.**

Plates 1–17

Specimens examined: Holotype: ♀ (UFES). Verbatim label data: “United Arab Emirates Al-Ajban, Malaise trap #5360, 23.v–26.vi.2006, A. van Harten, 24.36N 55.01E”. Triangle mounted; left antenna beyond scape missing, metasoma laterally collapsed, otherwise complete, in good condition. Paratypes: 3♂, same data as holotype. Triangle mounted; complete, in good condition; 3♂, same data except Malaise trap, 1.iv–2.v.2006; Malaise trap, 2–9.iv.2006; Malaise trap, 9–16.iv.2006.

Diagnosis: Species group: small size, delicate sculpturing pattern throughout body, highly reduced wing venation, veins 1M and 1Rs perfectly fused, straight; female with two large white spots restricted to T4. Species-level: T4 spots moderately large, separated from each other by a distance of about 0.6 their own length; petiole 1.5–1.6× the combined length of alinotum + propodeum.

Description of the female. Holotype. Length 7.99 mm, ovipositor 6.94 mm; morphometric ratios: Ov/Pt 3.38; Ov/Tt 0.87; Ov/HdI 8.24; Ov/Smw 10.18; CxI/h 3.30; CxI/Fml 0.82; FmSI 2.63; tw/iEE 0.47; btl/w 6.07; Pnl/Smw 1.20; tw/io 0.66; Pnl/Ew 1.81; Gsl/Ptl 1.39; Ptl/T3I 2.38; Hdl/Ew 1.86; Ew/tw 1.75; iEE/eEE 0.58; iEE/io 1.39; Ppl/Ew 1.49; io/oo 11.98; Ptl/Alinotum 1.44; 1Cu/1cu-a 1.15. Head (Plates 1–4, 6). Antenna (Plates 8–10) with 20 flagellomeres, central ones (6–13) nearly parallel-sided, weakly distinct from one another, flagellomeres 1–5 and 15–20 narrower apically than centrally, distinct from one another; flagellomeres 1 and 18–20 without tyloids, flagellomeres 2–17 with 1–5 tyloids, central flagellomeres with more tyloids than the basal and apical ones. Frons ventrally transversally rugose, otherwise finely areolate; microreticulate in between rugosities; frontal carina not distinct. Coronal area (Plates 2, 4) with a few carinae radiating from central ocellus, texture in between macrosculpture somewhat allutaceous; posterior pair of tubercles low and wide, almost meeting each other centrally, the area behind them widely smooth and polished. Vertex anteriorly (Plate 4), behind posterior pair of tubercles, with large transverse carina approximately shaped as an inverted “U”, the area behind it widely smooth and polished, followed by short transverse carina; both carinae continued into somewhat concentric areolate-rugose pattern on vertex centrally, this pattern weakening radially, not reaching temples nor occipital carina; vertex laterally and posteriorly, including temples, distinctly micro-areolate; dorso-longitudinal impression absent. Gena (Plate 6) dorsally and ventrally micro-areolate, centrally apparently smooth but in fact weakly alutaceous; genal angle in dorsal view weakly prominent (Plate 4). Occipital carina a narrow rim, ventrally ending far from hypostomal carina (Plates 3–4). Postgenal bridge alutaceous, almost immediately concave behind hypostomal carina, deep (Plate 3).

Mesosoma. Prosternum distinctly micro-areolate, apex emarginated as a “V”. Pronotum entirely micro-areolate; anterior margin emarginated as a “U”, nearly as deep as wide; neck



Plates 1–10. *Foenatopus bisignatus*, female holotype. 1: Habitus; 2: Head, coronal area; 3: Head, ventral, showing hypostomal bridge; 4: Head, dorsal; 5: Pronotum and mesoscutum, dorsal; 6: Head, lateral; 7: Pronotum and prosternum, lateral; 8: Right antennae, ventral, complete; 9: Right antennae, ventral, showing first eight flagellomeres; 10: Right antennae, ventral, detail of sensillae on flagellomeres III–VII.

(Plates 5, 7) dorsally weakly concave, transversally weakly striigate, only one complete carina; neck confluent with preannular, pronotal fold absent; preannular macrosculpture absent, centro-longitudinally with weak, irregular line of shallow depressions, deepest near semiannular; semiannular transversally rugose-striigate and micro-areolate to alutaceous in between; femoral impression absent; pronotal lobe weakly distinct from semiannular, crossed by strong strigation. Mesoscutum strongly transversally areolate-rugose; median sulcus linear; notaulus inconspicuous. Axilla alutaceous, mesally with several shallow foveolae. Scutellum alutaceous, with sparse, distinct, shallow foveolae; laterally with wide areolae or

shallowly concave. Mesepisternum glabrous, except for a few tiny hairs; changing from anteriorly densely rugulose to centrally and posteriorly micro-areolate. Mesopseudosternum finely alutaceous, discrimin straight, uniform, not crenulate. Propodeum (Plates 11–12) from anteriorly alutaceous and finely and densely rugulose to posteriorly densely rugose; spiracular groove and parapetiolar depression indistinct (Plate 13); carina of spiracular groove indicated by confluent rugosities; anterior and posterior spiracular plates indistinct. Metapleuron anteriorly micro-areolate, centrally and posteriorly strongly areolate-rugose, with few tiny, delicate, posteriorly decumbent hairs. Pleuropropodeal and metapleural fovea inconspicuous; interfoveolar area crenulate, deep; post-foveolar area occupied by metapleural macro-sculpture. Hind coxa latero-dorsally on basal 0.6 micro-areolate, otherwise distinctly transversely striate; hind femur (Plate 15) entirely micro-areolate (pentagonal and hexagonal units), finest basally and apically; ventrally at basal 0.2 with short triangular tooth, centrally and at apical 0.7 with long triangular tooth; 3–4 small tubercles between largest teeth, 2–3 beyond apical tooth; mesal side of largest teeth and tubercles in between smooth; all teeth apices bearing single short hair; the hairs longest and straight for apical tubercles. Hind tibia (Plates 15–16) longitudinally alutaceous; compressed part ventrally with two longitudinal carinae, both running strictly parallel up to level of dilated part, where both give place to distinct convergent strigation; dilated part in posterior view with a strong mesal compression, producing an oblique border (Plate 16); mesal tibial spur about as long as lateral spur.

Wings. Fore wing venation beyond 1cu-a and 1M spectral, except pterostigma fully distinct, vein 1Cu spectral only on apical 0.2, and crossvein 2r fully tubular and continuous with 4Rs, which disappears nearly half way from wing margin; vein M+Cu with three widely spaced, subapical setae; vein 1M fused with 1Rs, perfectly straight; crossvein 1cu-a slightly post-furcal; vein 1-1A with three widely spaced, long, sub-basal setae, apex curved upwards toward apex of crossvein 1cu-a. Hind wing with vein Sc+R fully tubular; other veins indistinct.

Metasoma. Petiole very finely and densely transversely to irregularly striate; T3 very finely and weakly longitudinally alutaceous; T4–8 microscopically transversely alutaceous, this pattern on apical half of T7 and entire T9 distinctly alutaceous. Pygidium (Plate 14) a convex plate, wide, posterior margin weakly emarginate; pygidial impression deep, intermediate between V- and U-shaped.

Colour. Brown. Head brown with reddish tinge, vertex darkest; clypeus pale yellow; mandible apex black; antenna light brown; gena below eye with pale yellow spot; prothorax, including fore legs, brown with reddish tinge, except posterior margin of pronotum golden yellow and tarsi light brown; mesothorax dark brown, mid legs brown, except tibia basal 0.1 and tarsi, pale yellow; hind leg brown with reddish tinge, except compressed part of hind tibia light brown; basal, central, and apical teeth on ventral side of femur whitish, central one lightest; basitarsus from apically light brown to basally pale yellow. Propodeum and metapleuron from anteriorly dark brown to posteriorly reddish brown. Petiole basal 0.4 and apical 0.1 light brown to pale yellow, centrally brown. Metasoma brown, T4 centrally on each side with a large whitish spot. Ovipositor sheath mostly light brown, then continuously changing to apex dark brown. Wings hyaline, veins light brown, pterostigma basal 0.4 whitish.

Male. Similar to female, except as follows. Length 6.00–7.75 mm; morphometric ratios: CxL/h 3.50–4.22; CxL/Fml 0.69–0.91; FmSI 2.50–3.38; tw/iEE 0.43–0.53; btl/w 4.67–7.50; PnL/Smw 1.19–1.52; tw/io 0.72–0.83; PnL/Ew 1.93–2.23; Gsl/Ptl 1.11–1.61; Ptl/T31 2.24–2.92; Hdl/Ew 2.00–2.15; Ew/tw 1.20–1.67; iEE/eEE 0.60–0.69; iEE/io 1.45–1.71; Ppl/Ew 1.46–1.92; io/oo 6.00–8.00; Ptl/Alinotum 1.27–1.89; 1Cu/1cu-a 0.76–0.91 (ratios for left and



Plates 11–16. *Foenatopus bisignatus*, female holotype. 11: Alinotum and propodeum, dorsal; 12: Propodeum, dorsal; 13: Mesothorax, metathorax and propodeum, lateral; 14: Eighth tergite, showing pygidium, dorsal; 15: Left hind femur and tibia, lateral; 16: Left hind tibia, dorsal. Plate 17: *Foenatopus bisignatus*, male paratype, petiole, dorsal.

right wings respectively). Antenna with 17–18 flagellomeres. Clypeus and petiole on basal 0.3 pale yellow, almost white; vein 1Cu shorter than 1cu-a (see above); T4 with two whitish spots, otherwise uniformly light brown, lightest of tergites.

All males of *F. bisignatus* have double spots on T4 only, thus immediately distinguishing them from males of *F. buprestivorus* Benoit, 1984, which have double spots on all tergites from T4 to T7. Males of *F. bisignatus* can also be distinguished from similar stephanids by having the basal 0.4 of petiole dorsally yellowish white (Plate 17).

Discussion: This species belongs to the *F. turcomanorum* complex (Aguiar et al., unpublished observation), from which it can be differentiated by showing the following combination of

features. Preannular centrally microreticulate only (vs. sometimes transversely strigate); propodeum mostly densely areolate-rugose, moderately stronger posteriorly (vs. sometimes changing from anteriorly strongly microreticulate to posteriorly strongly areolate-rugose); mesoscutum areolate-rugose (vs. sometimes strong U-shaped areolation); median sulcus distinct (vs. sometimes indistinct); T4 spots moderately large, separated from each other by a distance of about 0.6 their own length (vs. sometimes small and widely separated).

From *F. turcomanorum* in particular, it can be distinguished by having the coronal area showing a radiating sculpturing pattern (vs. not radiating); vertex sculpturing somewhat areolate (vs. rugose or nearly so); temple micro-areolate (vs. somewhat striate); gena mostly smooth (vs. largely reticulate); preannular microreticulate (vs. pronotum striate on entire length); female petiole on basal third and apex diffusely yellowish (vs. with small, discrete pale yellow spots); spots on female T4 large, separated from each other by a distance of about 0.6 their own width (vs. small, separated by twice their own width). Also different by the narrow temple (tw/iEE 0.43–0.53, female 0.47, vs. 0.59 in *F. turcomanorum*); propodeum short (Ppl/Ew 1.46–1.92, female 1.49, vs. 2.05); and vein 1Cu quite short (1Cu/1cu-a 0.76–1.00, female 1.15, vs. 2.29).

Foenatopus buprestivorus (= *F. hoggarensis* Hedqvist, 1966; probably also same species as *F. curletti* Pagliano, 1986) is also similar to *F. bisignatus*, but Benoit's species has double spots on all tergites from T4 to T7 (illustrated by Mateu, 1972: 602), the head is compressed antero-posteriorly, the gena is protruded behind eye (vs. head normal; Fig. 4 vs. Figs 5B–C in Hedqvist, 1967: 188), and the hind femur has a distinct pattern of teeth and tubercles (Fig. 15 vs. Fig. 5D in Hedqvist, 1967: 188).

Other similar species, such as *F. albomaculatus* Cameron, 1906, *F. fragilis* Benoit, 1949, and *F. lueboensis* Benoit, 1949, have T4 with a transverse white or yellowish spot or band, but never with two large spots as in *F. bisignatus*.

Biology: Unknown. Mateu (1972) and Pagliano (1986) reported *F. buprestivorus* and *F. curletti*, which seem to be closely related to *F. bisignatus*, emerging from shrubs infested with *Acmaeodera* spec., *Acmaeoderella* spec., *Agrilus* spec., and *Anthaxia* spec., all Buprestidae (Coleoptera). Another related species was reared from Cerambycidae larvae (Aguiar et al., in litt.).

Distribution: UAE. This is the first record of the family for the Arabian Peninsula.

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Order Hymenoptera, family Platygastridae (Part 2)

Peter Neerup Buhl

INTRODUCTION

Seven species new to the United Arab Emirates are recorded in this paper along with new records of species already known from the UAE. Four species are described as new to science: *Fidiobia vanharteni*, *Piestopleura vanharteni*, *Platygaster deserta* and *Synopeas darwini*. With my earlier contribution to the platygastrid fauna of the UAE (Buhl, 2008), 24 species of the family are hereby recorded from the UAE.

MATERIALS AND METHODS

Unless otherwise stated, the specimens dealt with here were collected by A. van Harten. All holotypes are deposited in the Zoological Museum, University of Copenhagen, Denmark (ZMUC), the rest of the material is distributed equally between ZMUC and the United Arab Emirates Invertebrate Collection (UAEIC). For abbreviations used I refer to Buhl (2008).

SYSTEMATIC ACCOUNT

Amblyaspis cf. *scelionoides* (Haliday, 1835)

Specimens examined: Al-Ajban, 1♂, 3♀, 2–9.iv.2006, LT. Fujairah, 1♀, 8–29.v.2006, LT. Hatta, 6♀, 30.i–26.ii.2006, LT. Sharjah Desert Park, 1♀, 30.iv–25.v.2008, LT. Sharjah-Khor Kalba, near tunnel, 2♀, 26.iv–3.v.2006, LT. Wadi Bih dam, 1♀, 21–30.iv.2008, LT; 1♀, 13–20.v.2008, LT. Wadi Wurayah farms, 1♂, 2♀, 22.ii–2.iii.2009, LT; 2♀, 15–30.iii.2009, LT.

Anirama semiclavata Buhl, 2008

Specimens examined: Al-Rafah, 5♂, 7♀, 27–30.iv.2008, WT; 15♂, 3♀, 18–22.v.2008, WT; 17♂, 9♀, 1–12.ii.2009, WT. Sharjah Desert Park, 3♂, 2♀, 1–12.ii.2009, PT. Wadi Bih dam, 1♀, 16–23.v.2007, LT.

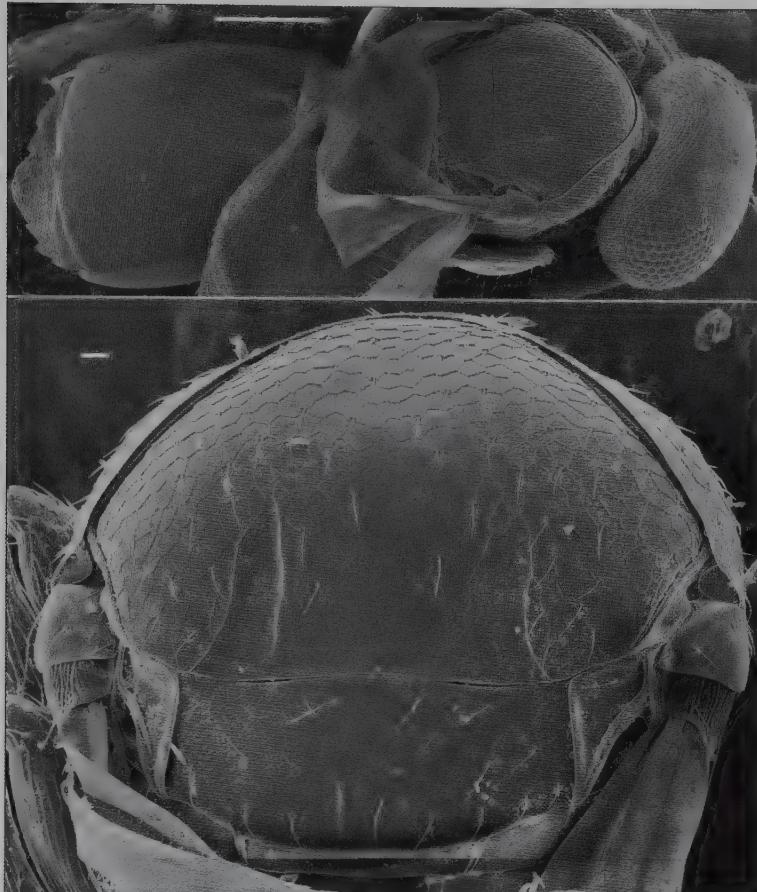
Fidiobia vanharteni Buhl nov. spec.

Plates 1–2, Figures 1–2

Specimens examined: Holotype: ♀, Wadi Bih dam [25°48'N 56°04'E], 24.iv.–1.v.2007, in light trap, leg. A. van Harten. Paratypes: 2♀, same data; 1♀, same data but 15–22.iii.2007; 2♂, 3♀, same data but 22–29.iii.2007; 1♀, same data but 16–23.v.2007; 3♀, same data but 6–13.vii.2007; 3♀, same data but 13–20.v.2008; 1♂, same data but 25.ii–8.iii.2009, MT. Khor al-Khwair, 9♀, 3–24.iv.2007, LT; 3♀, 2–13.v.2007, LT; 5♀, 16–23.v.2007, LT. Near Mahafiz, 1♀, 2.ii–2.iii.2006, LT.

Diagnosis: Head more than twice as wide as long, finely sculptured; female A3–A4 not elongate; mesocutum partly sculptured, partly smooth, with posteriorly widened notaui; female metasoma longer than rest of body.

Description: Female. Body length 0.60–0.80 mm. Blackish, sometimes T1 and base of T2 lighter; A1–A6 and legs including coxae yellowish brown; A7–A9, mandibles and tegulae dark brown. Head from above (Plate 1) 2.3–2.5 times as wide as long, as wide as mesosoma, without hyperoccipital carina; occiput, vertex and malar space finely and slightly transversely reticulate-coriaceous, on frons smoothly reticulate. OOL slightly shorter than diameter of lateral ocellus. Head in frontal view wider than high (15:11), malar space fully half as long as height of an eye. Antenna (Fig. 1) with A1 shorter than height of head (8:11), and shorter than distance between inner orbits (8:9).



Plates 1–2. *Fidiobia vanharteni* Buhl nov. spec., female. 1: Body from above; 2: Mesoscutum and scutellum from above. Scale bar = 100 pm (Plate 1) and = 10 pm (Plate 2).

Mesosoma (Plates 1–2) slightly longer than wide (16:15), 1.7 times as wide as high. Sides of pronotum reticulate–coriaceous (not longitudinally so), smooth in more than lower half.

Mesoscutum with sparse, scattered setae, weakly reticulate–coriaceous, smooth in about posterior 0.4 between notauli; notauli distinct, visible in about posterior half of disc, parallel, smooth, widened behind. Mesopleuron with longitudinal striae on a smooth background. Scutellum smooth, with sparse setae, about three times as wide as long. Metapleuron smooth, with pilosity only along margins.

Forewing about 0.8 times as long as entire body, overreaching tip of metasoma by a length equal to length of T3–T6 combined, almost clear, with fine and dense microtrichia, 2.5 times as long as wide; submarginal vein 0.17 times as long as wing, light brown; marginal cilia absent. Hindwing about six times as long as wide; marginal cilia half the width of wing.

Metasoma (Plate 1) about 1.1 times as long as head and mesosoma combined, 1.5 times as long as mesosoma, as wide as this, smooth. T1 with a groove along margins. T2 with four

basal foveae, the medial ones almost confluent, 0.25 as long as tergite, the lateral ones 0.4 times as long as tergite. Apical tergites with a few inconspicuous setae.

Male. Body length 0.60 mm. Antenna (Fig. 2) entirely yellowish brown; head, propodeum, T1 and base of T2 medium brown. Metasoma as long as head and mesosoma combined.

Remarks: *Fidiobia polita* Buhl, 1998, differs from this species in having less transverse head, less distinct notaui, shorter metasoma and darker body appendages. *F. vanharteni* differs from the two *Fidiobia* species described by Nixon (1969) as well as from *F. asina* Loiacono, 1982, and *F. dominica* Evans & Pena, 2005, in structure of notaui. *F. synergorum* (Kieffer, 1921) lacks notaui. *F. hofferi* Kozlov, 1971, has OOL two times as long as diameter of lateral ocellus, and *F. rugosifrons* Crawford, 1916, is larger than *F. vanharteni*, it has basal flagellar segments slightly different, and it has rougher sculptured head, cf. Kozlov (1978). *F. flavipes* Ashmead, 1894, has more slender basal flagellar segments than *F. vanharteni*, cf. Fouts (1924). *F. danielsoni* Buhl, 2001, has mesoscutum uniformly reticulate-coriaceous, less transverse scutellum, more sculptured metasoma, and darker body appendages than *F. vanharteni*. *F. drakei* (Ogloblin, 1944) has head less transverse and mesoscutum differently sculptured than in *F. vanharteni*, cf. Ogloblin (1944), Buhl (2001) and Evans & Pena (2005).

Biology: *Fidiobia* species are known to parasitize eggs of the coleopterous families Chrysomelidae and Curculionidae (see Evans & Pena, 2005). The host of the new species is not known.

Etymology: Named after the collector.

***Gastrotrypes spatulatus* Brues, 1922**

Specimens examined: Wadi Bih dam, 1♀, 25.ii–8.iii.2009, MT.

Distribution: Known from the Neotropical, Palaearctic, Afrotropical and Oriental regions. New to the UAE.

***Inostemma filicornis* Buhl, 2008**

Specimens examined: Al-Ajban, 1♀, 30.i–26.ii.2006, MT. N of Ajman, 1♀, 18–22.v.2008, WT; 4♂, 30♀, 22.ix–17.x.2008, WT. Near Mahafiz, 2♂, 4♀, 2.ii–2.iii.2006, LT. Al-Rafah, 1♀, 27–30.iv.2008, WT; 1♀, 18–22.v.2008, WT; 5♂, 2♀, 1–12.ii.2009, WT; 1♀, 17.iii.2009, WT. Sharjah Desert Park, 1♀, 1–6.iv.2008, LT. Wadi Maidaq, 1♀, 20.ii–2.iii.2009, WT.

***Leptacis bispinosa* Buhl, 2005**

Specimens examined: Al-Ajban, 1♀, 28.xii.2005–29.i.2006. Sharjah Desert Park, 1♀, 18.i–25.ii.2006, LT.

Distribution: Described from South Africa. New to the UAE.

***Leptacis laodice* (Walker, 1835)**

Specimens examined: Wadi Bih dam, 1♀, 22–29.iii.2007, LT; 3♂, 3♀, 29.iii.2007, swept, leg. F. Menzel; 1♀, 25.ii–8.iii.2009, MT. Wadi Maidaq, 1♀, 20.ii–2.iii.2009, WT.

Distribution: Widely distributed in W Europe. New to the UAE.

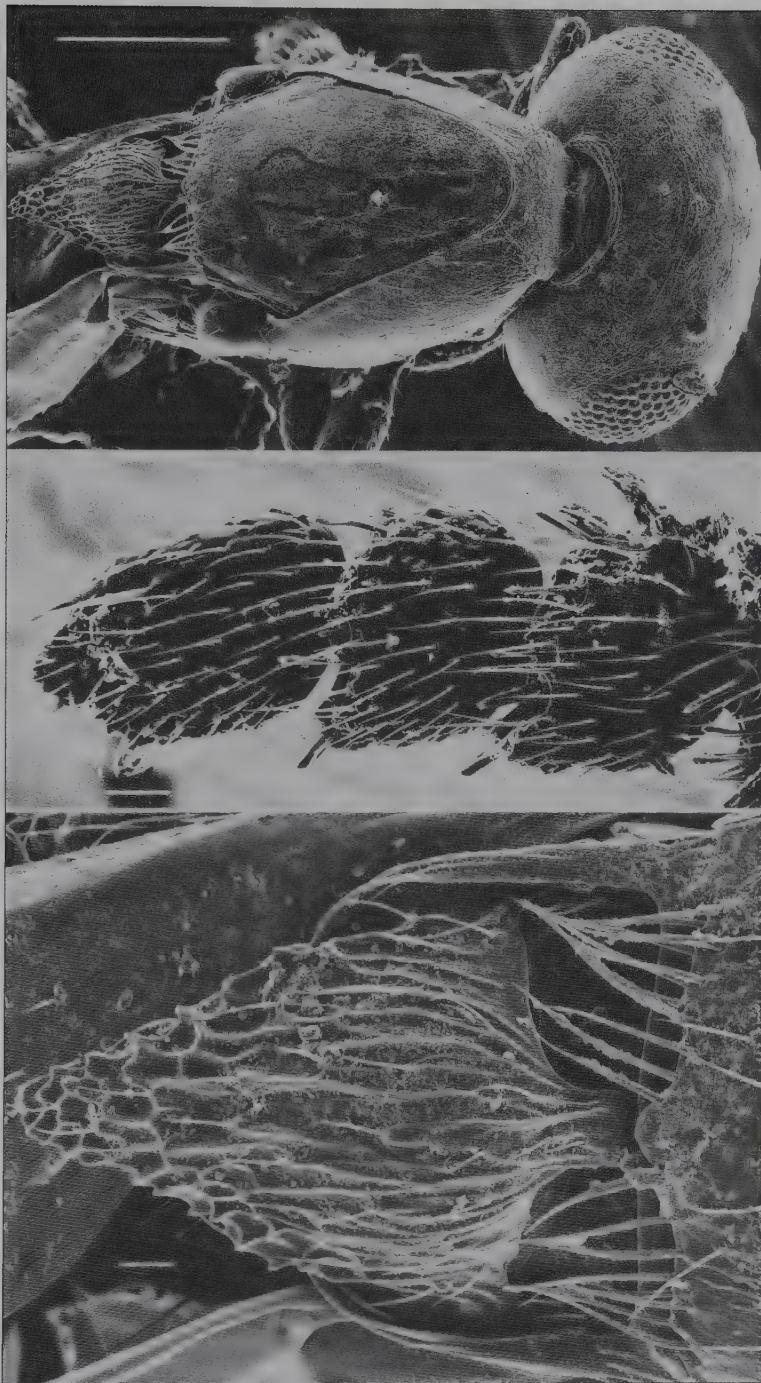
***Piestopleura vanharteni* Buhl nov. spec.**

Plates 3–5, Figures 3–7

Specimens examined: Holotype: ♀, Sharjah Desert Park [25°17'N 55°42'E], 12–21.v.2007, in light trap, leg. A. van Harten. Paratype: 1♀, same data but 17–24.iii.2007. 1♂, al-Ajban, 30.i–26.ii.2006, MT.

Diagnosis: Mesosoma hardly twice as long as wide, 1.3 times as high as wide, forewings without marginal cilia.

Description: Female. Length 0.85–1.30 mm. Black, T1 with brownish tint; A1 and legs including coxae light reddish-brown; mandibles, tegulae, A2–A10 and last segment of tarsi dark brown.



Plates 3-5. *Piestopleura vanharteni* Buhl nov. spec., female. 3: Head and mesosoma from above; 4: Antennal segments 8-10; 5: Scutellum from above. Scale bar = 100 pm (Plate 3) and = 10 pm (Plates 4-5).

Head from above (Plate 3, Fig. 3) twice as wide as long, 1.3 times as wide as mesosoma, finely and almost uniformly reticulate-coriaceous (not transversely so), with traces of a hyperoccipital carina. OOL equal to diameter of lateral ocellus, half as long as LOL. Head in frontal view 1.25 times as wide as high. Antenna (Plate 4, Fig. 4) with A1 0.75 times as long as height of head, shorter than distance between inner orbits (13:14).

Mesosoma (Plate 3) 1.9 times as long as wide, 1.3 times as high as wide. Sides of pronotum with weak longitudinal reticulation, smooth along broad upper and hind margins. Mesoscutum faintly reticulate-coriaceous, sculpture strongest anteriorly, with sparse and scattered short setae; notauli entirely absent; hind margin medially with a small, narrow prolongation to base of scutellum; scuto-scutellar grooves wide, with numerous conspicuous long setae. Mesopleuron smooth, with weak longitudinal striae in most of upper third. Scutellum (Plates 3 and 5, Fig. 5) dull, with very rough sculpture and a few inconspicuous setae, semitransparent brown in posterior half, in dorsal view triangular with straight sides, in lateral view with a thick spine overreaching propodeum, without lamella. Metapleuron smooth and bare in anterior half, with pilosity in posterior half. Propodeal carinae low, dark, slightly diverging, well separated; area between them hardly more than 1.5 times as long as wide, almost smooth.

Forewing almost clear, 2.6 times as long as wide, 0.7 times as long as entire body, with dense but very short microtrichia; marginal cilia absent. Hind wing 5.1 times as long as wide; marginal cilia one-third the width of wing.

Metasoma (Fig. 6) 0.9 times as long as head and mesosoma combined, 1.1 times as long as mesosoma, about as wide as this. T1 with two strong longitudinal carinae and a weak medial one, with a few inconspicuous setae. T2 striated over whole width to nearly 0.3 of length of tergite, striae from the weak basal foveae slightly longer than the medial and outer lateral striae, rest of tergite smooth. T3–T5 smooth, with micropunctuation along narrow hind margins; T6 with such micropunctuation all over. T4–T5 each with about eight very short setae arranged in shallow punctures in a transverse row close to hind margins, T6 with fewer such short setae.

Male. Body length 1.05 mm. Antenna (Fig. 7) coloured as in female, A8–A9 each 1.8 times as long as wide, flagellar pubescence inconspicuous, only a few setae approaching a length equal to width of segments. Metasoma as long as mesosoma.

Remarks: Approaches Spanish *P. garrido* Buhl, 2001, in shape of scutellum, but *P. vanharteni* has less elongate A8–A9 and meso- and metasoma, and *P. garrido* has distinct marginal cilia on forewings. *P. vanharteni* has even less elongate mesosoma than the North American *P. platygaster* (Fouts, 1925); this last mentioned species has a short, hook-shaped scutellar spine and long marginal cilia of forewings.

Etymology: Named after the collector.

Piestopleura cf. *nievesi* Buhl, 2001

Specimens examined: Al-Ajban, 1♀, 30.i–26.ii.2006, MT. Fujairah, 1♂, 8–29.iv.2006, LT. Sharjah Desert Park, 1♀, 25.v–16.vi.2008, LT. Wadi Bih dam, 1♀, 16–23.v.2007, LT; 2♀, 6–13.vii.2007, LT. Wadi Wurayah farm, 1♂, 17–24.iii.2009, MT.

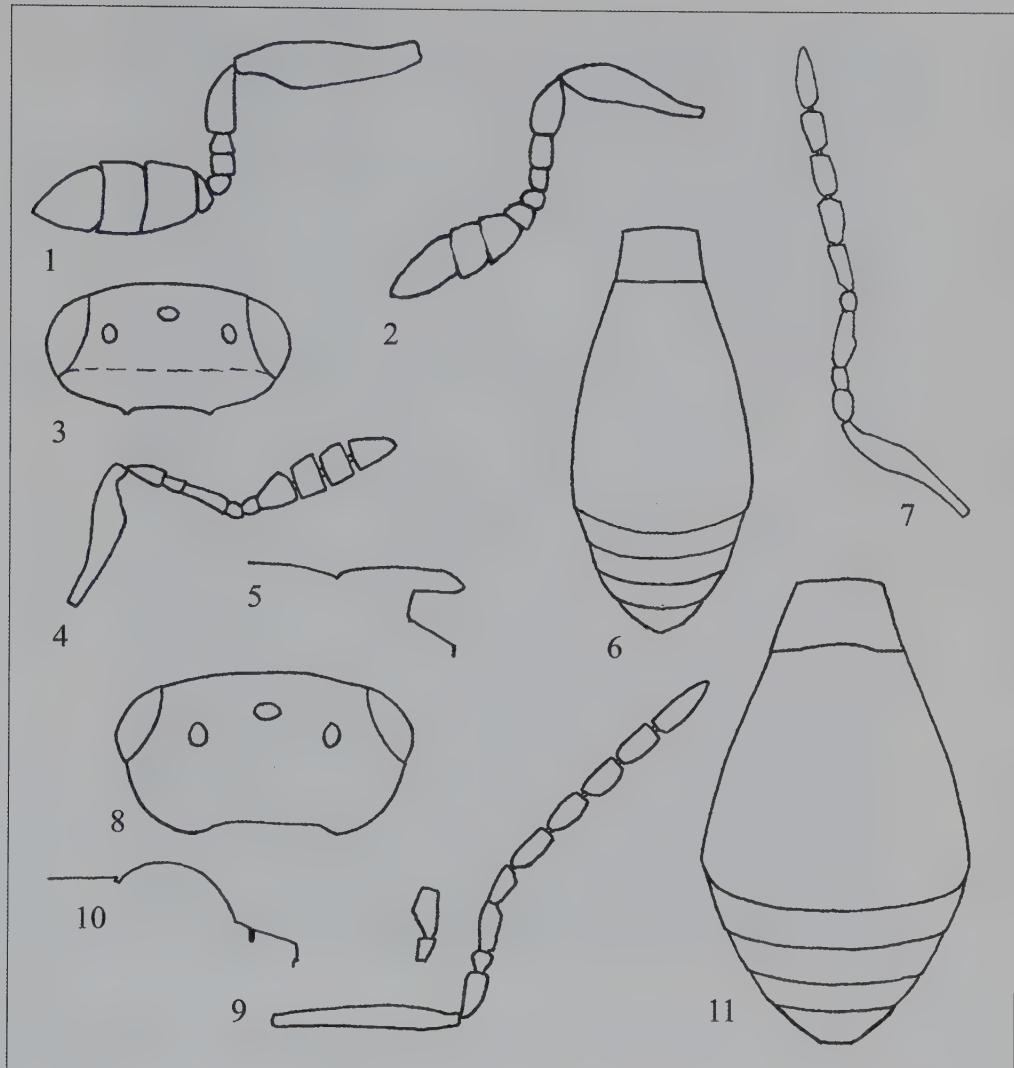
Platygaster arabica Buhl, 2008

Figures 8–11

Described on the basis of unique female holotype by Buhl (2008).

Additional specimens examined: Al-Ajban, 1♀, 30.i–26.ii.2006, MT; 1♂, 25.ii–27.iii.2006, LT. Sharjah Desert Park, 1♂, 17.ii–3.iii.2007, LT. Wadi Wurayah farm, 1♀, 17–24.iii.2009, MT.

Description of the hitherto unknown male: Length 1.5 mm. Black; mandibles, A1, tegulae and



Figures 1–11. 1–2, *Fidiobia vanharteni* Buhl nov. spec. 1: Female, antenna; 2: Male, antenna. 3–7, *Piestopleura vanharteni* Buhl nov. spec. 3: Head from above; 4: Female, antenna; 5: Scutellum and propodeum in lateral view; 6: Female, metasoma from above; 7: Male, antenna. 8–11, *Platygaster arabica* Buhl, 2008, male. 8: Head from above; 9: Antenna (A4 also from another angle); 10: Scutellum and propodeum in lateral view; 11: Metasoma from above.

legs including coxae light brownish yellow; A2–A10 dark brown. Antenna (Fig. 8) with A7–A10 each twice as long as wide. Metasoma (Fig. 11) 0.9 times as long as head and mesosoma combined.

Platygaster athamas Walker, 1835

Specimens examined: Hatta, 1♂, 2♀, 30.i–26.ii.2006, LT.

***Platygaster baezi* Buhl, 2003**

Specimens examined: Wadi Midaq, 1♂, 1♀, 20.ii–2.iii.2009, WT.

***Platygaster deserta* Buhl nov. spec.**

Plates 6–7, Figures 12–16

Specimens examined: Holotype: ♀, al-Rafah [25°43'N 55°51'E], 27–30.iv.2008, in water trap, leg. A. van Harten. Paratypes: 5♂, 5♀, same data. 1♂, Sharjah Desert Park, 1–6.iv.2008, LT; 1♂, 6–30.iv.2008, LT.

Diagnosis: Occiput finely and densely transversely striated; female A9 1.5 times as long as wide; notaui almost complete; scutellum smooth and evenly convex; metasoma at most as long as rest of body, T1 twice as wide as long, T2 striated to at most 0.25 of length; apical tergites with a few indistinct punctures.

Description: Female. Body length 1.05–1.20 mm. Body black, antennae and legs including coxae dark brown; trochanters, base and apex of anterior tibiae, base of mid and hind tibiae, and segments 1–4 of all tarsi light brownish; T1 slightly to distinctly lighter than rest of body, dark to light brown.

Head from above (Plates 6–7, Fig. 12) 2.0 times as wide as long, almost 1.2 times as wide as mesosoma; occiput rounded, finely and densely transversely striated; vertex faintly transversely reticulate-coriaceous; frons with weak oblique striation, strongest in lower half, smooth along broad midline except just above antennae. OOL = 1.25 LOL. Eyes with sparse, short setae. Head in frontal view 1.25 times as wide as high. Antenna (Fig. 13) with A1 0.8 times as long as height of head, about as long as distance between inner orbits; A9 about 1.5 times as long as wide.

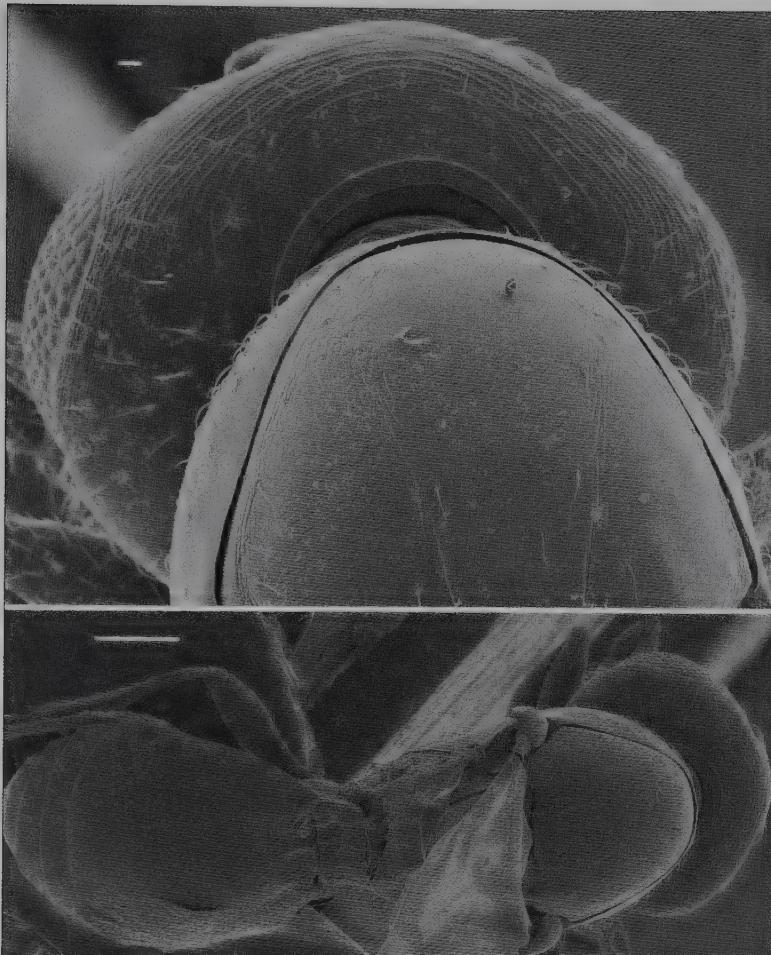
Mesosoma (Plates 6–7) 1.6 times as long as wide, measured at highest point in front of scutellum wider than high (18:17) to as high as wide. Sides of pronotum smooth except for a few raised seta-implantations in upper anterior corner. Mesoscutum smooth, only with a few short setae along notaui and margins; notaui distinct, fading out in weak rugosity just before reaching anterior margin, only slightly converging, posteriorly widely separated; mid lobe slightly and bluntly prolonged to base of scutellum; scuto-scutellar grooves each with at most four inconspicuous setae. Mesopleuron smooth, sometimes weakly leathery in upper 0.25. Scutellum (Fig. 14) strongly and evenly convex, smooth, only with a few setae laterally. Metapleuron with pilosity all over. Propodeal carinae short, parallel; transverse area between them smooth.

Forewing clear, 0.7 times as long as entire body, 2.4 times as long as wide, with fine and rather sparse microtrichia; marginal cilia 0.05 the width of wing. Hindwing 4.4 times as long as wide, with two hamuli; marginal cilia 0.25 the width of wing.

Metasoma (Plate 7, Fig. 15) 0.85–1.0 times as long as head and mesosoma combined, 1.1 times as wide as mesosoma. T1 fully twice as wide as long, with a distinct transverse depression at midlength, with two almost complete longitudinal carinae and a slightly weaker medial one, and around midlength with numerous short longitudinal carinae, at sides with long, sparse outstanding setae. T2 striated in and between basal foveae to at most 0.25 of length. T3–T6 smooth, with a few setae inserted in very inconspicuous punctures (four on T3, six on T4, eight on T5).

Male. Body length 0.95–1.30 mm. Antenna (Fig. 16) with A9 1.4 times as long as wide; flagellar pubescence standing away from the segments to a distance equal to 0.5 the width of segments. Metasoma 0.75–0.85 times as long as head and mesosoma combined.

Remarks: This otherwise poorly characterised species is rather distinct due to the structure of base of metasoma. It differs from the in this respect similar Mongolian *P. brevipetiolata* Buhl, 2004, in having more elongate female antennae and metasoma, smoother sides of pronotum, and in having seta-implantations on scutellum and apical tergites weaker. Also Mongolian



Plates 6–7. *Platygaster deserta* Buhl nov. spec., female. 6: Head from behind, mesoscutum from above; 7: Body from above. Scale bar = 10 pm (Plate 6) and = 100 pm (Plate 7).

P. oviventris Buhl, 2004, has much transverse T1 but much differently shaped head and scutellum than in *P. deserta*, cf. Buhl (2004). Among the species keyed by Kieffer (1926), *P. deserta* seems to be most similar to *P. persicariae* Kieffer, 1906, from Paris, France, but this species has female A4 almost twice as long as A3, and flagellum widened towards apex, male A5–A9 almost twice as long as wide, and female T6 not wider than long.

Etymology: The species is named after its desert habitat.

***Platygaster harteni* Buhl, 2008**

Specimens examined: N of Ajman, 1♂, 22.ix–17.x.2008, WT. Hatta, 1♂, 30.i–26.ii.2006, LT. Al-Rafa, 1♀, 17.iii.2009, WT. Sharjah Desert Park, 1♀, 25.v–16.vi.2008, LT. Wadi Maidaq, 1♀, 20.i.–3.ii.2008, WT.

***Platygaster papei* Buhl, 2008**

Specimens examined: Bithnah, 1♂, 4–26.iii.2006, LT. Wadi Safad, 1♀, 4–26.iii.2006, LT. Wadi Wurayah farm, 1♀, 15–30.iii.2009, LT; 2♀, 17–24.iii.2009, MT.

***Platygaster vercammeni* Buhl, 2008**

Specimens examined: N of Ajman, 1♂, 2♀, 15–16.iii.2009, WT. Sharjah Desert Park, 1♂, 12–21.v.2007, LT; 4♂, 1♀, 30.iv–25.v.2008, LT; 1♂, 25.v–16.vi.2008, LT; 8♂, 16.vi–17.vii.2008, LT; 1♂, 17–24.vii.2008, LT; 3♂, 24.vii–14.viii.2008, LT; 3♂, 9.viii–4.ix.2008, LT. Um al-Quwain, 4♀, 11–13.iii.2009, WT, leg. C. Schmid-Egger. Wadi Safad, 1♂, 26.iv–4.v.2006, LT.

***Synopeas harteni* Buhl, 2008**

Specimens examined: Al-Ajban, 1♂, 30.i–26.ii.2006, MT. N of Ajman, 1♂, 1♀, 15–16.iii.2009, WT. Sharjah Desert Park, 8♀, 30.iv–25.v.2008, LT; 1♂, 25.v–16.vi.2008, LT. Um al-Quwain, 238♂, ♀, 11–13.iii.2009, WT, leg. C. Schmid-Egger. Wadi Safad, 1♀, 4–26.iii.2006, LT. Wadi Shawkah, 1♀, 5–12.v.2007, WT. Wadi Wurayah farm, 3♂, 5♀, 15–30.iii.2009, LT.

***Synopeas khalidi* Buhl, 2008**

Specimens examined: N of Ajman, 2♂, 15–16.iii.2009, WT.

Remarks: This species has been reared from the cecidomyiid galls caused by *Izeniola obesula* Dorchin, 2001, on the plant *Suaeda monoica* in Saudi Arabia (leg. Hassan A. Dawah, National Museum Wales).

***Synopeas laurae* (Vlug, 1991)**

Specimens examined: Bithnah, 1♂, 1♀, 4–26.iii.2006, LT. Sharjah–Khor Kalba, near tunnel, 1♀, 26.iv–3.v.2006, LT. Wadi Bih dam, 1♀, 6–13.vii.2007, LT. Wadi Maidaq, 3♂, 20.ii–2.iii.2009, WT. Wadi Safad, 1♀, 4–26.iii.2006, LT. Wadi Wurayah farm, 1♂, 8–15.iii.2009, LT; 1♂, 15–30.iii.2009, LT; 1♂, 17–24.iii.2009, MT; 1♂, 24–30.iii.2009, MT.

***Synopeas osaces* (Walker, 1835)**

Specimens examined: Bithnah, 1♂, 1♀, 4–26.iii.2006, LT. Wadi Safad, 1♀, 4–26.iii.2006, LT; 1♀, 26.iv–4.v.2006, LT. Wadi Wurayah farm, 1♂, 1♀, 24–30.iii.2009, MT.

***Synopeas scutoscutellaris* Buhl, 2008**

Specimens examined: Sharjah Desert Park, 1♀, 6–30.iv.2008, LT; 1♂, 10♀, 30.iv–25.v.2008, LT; 1♀, 16.vi–17.vii.2008, LT. Wadi Maidaq, 1♂, 20.ii–2.iii.2009, WT. Wadi Safad, 1♂, 4–26.iii.2006, LT. Wadi Wurayah farm, 25♂, 4♀, 17–24.iii.2009, MT; 1♀, 15–30.iii.2009, LT; 2♂, 1♀, 24–30.iii.2009, MT.

***Synopeas darwini* Buhl nov. spec.**

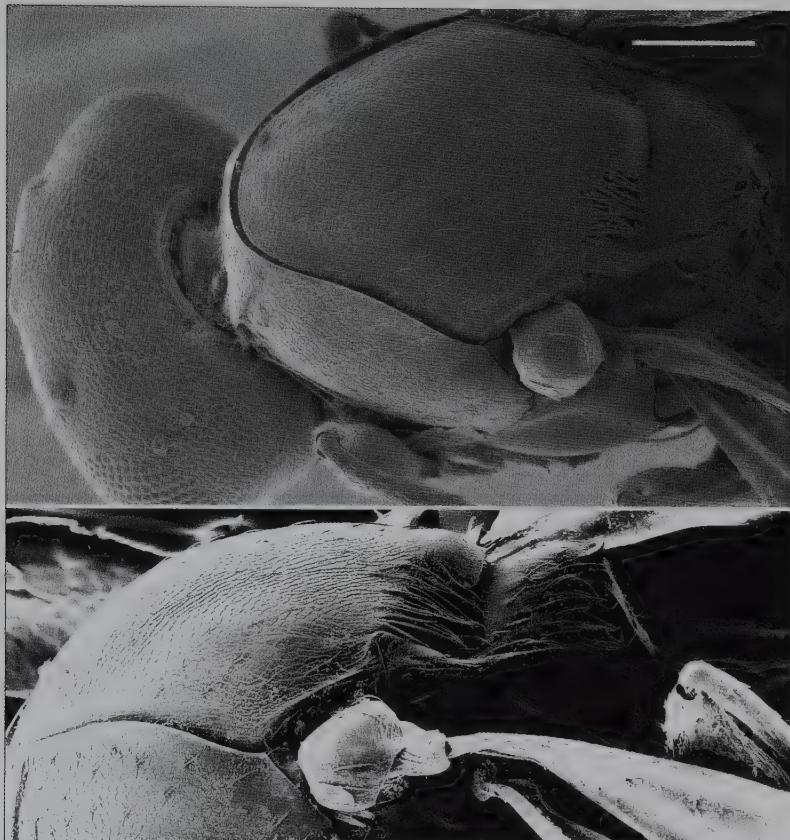
Plates 8–11, Figures 17–20

Specimens examined: Holotype: ♀, near Mahafiz [25°09'N 55°48'E], 4–11.iv.2006, in light trap, leg. A.van Harten. Paratype: 1♀, Khor al-Khwair, 7–14.iv.2007, LT.

Diagnosis: Head more than twice as wide as long; scutellum at level of mesoscutum, posteriorly with a narrow, dark medial lamella below a very small tooth; female metasoma slightly longer than rest of body and slightly higher than wide; wide hind margin of T2 and apical tergites extensively microsculptured; legs except coxae brightly coloured.

Description: Female. Body length 1.5–1.7 mm. Black, antennae and coxae hardly lighter; mandibles and legs light reddish brown; base and apex of fore tibiae, basal half of mid and hind tibiae, and segments 1–4 of all tarsi yellowish brown; last segment of tarsi dark.

Head from above (Plate 8, Fig. 17) 2.15 times as wide as long, slightly more than 1.1 times as wide as mesosoma, finely reticulate-coriaceous, in lower half of frons with weak transverse elements; occiput evenly rounded, with no trace of hyperoccipital carina. OOL 1.5 times as

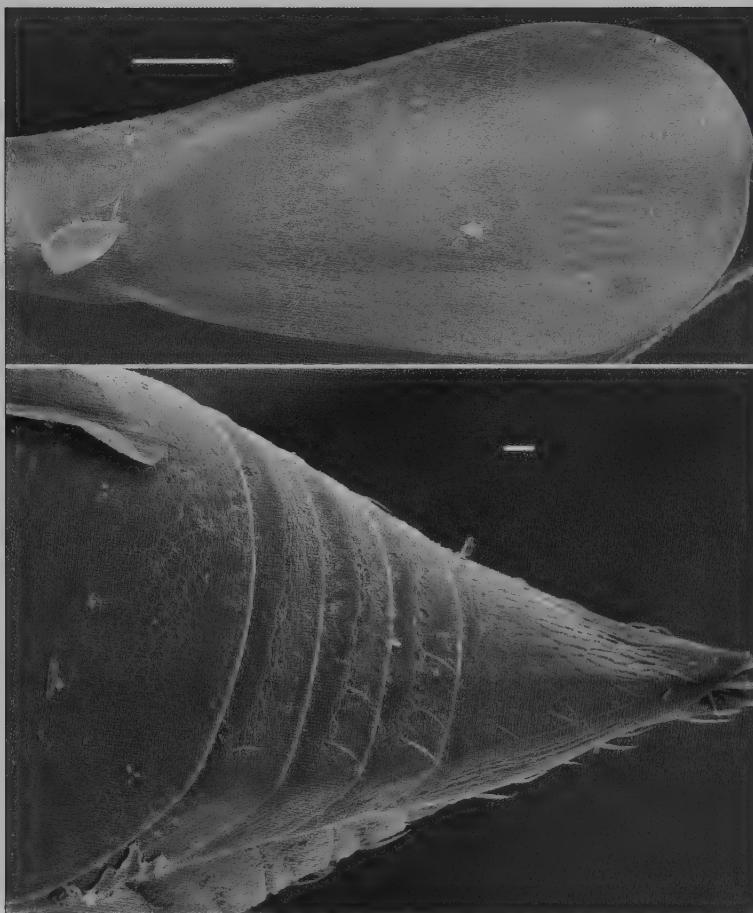


Plates 8–9. *Synopeas darwini* Buhl nov. spec., female. 8: Head and mesosoma from above; 9: Mesoscutum and scutellum in lateral view. Scale bar = 100 pm.

long as diameter of lateral ocellus; LOL = 1.5 OOL. Head in frontal view one and a third times as wide as high. Antenna (Fig. 18) with A1 shorter than height of head (17:20) and than distance between inner orbits (17:18).

Mesosoma (Plate 8) 1.4 times as long as wide, slightly more than 1.1 times as high as wide. Sides of pronotum reticulate, in lower half slightly longitudinally so, only smooth along narrow hind margin. Mesoscutum faintly reticulate-coriaceous, with sparse and scattered setae; no trace of notauli; mid lobe medially with a broad, smooth, brownish prolongation to base of scutellum; scuto-scutellar grooves wide, with dense and conspicuous long white setae. Mesopleuron smooth, in upper one-sixth dull and with weak longitudinal microsculpture. Scutellum (Plate 9, Fig. 19) antero-medially smooth and with very few setae, laterally and posteriorly densely setose, on posterior slope with a narrow, dark medial lamella below a very small tooth. Metapleuron smooth and bare in about anterior 0.25, rest with white pilosity. Propodeal carinae rounded, semitransparent brown, fused.

Forewing (Plate 10) clear, 2.8 times as long as wide, hardly reaching apex of metasoma, with fine and dense microtrichia, without marginal cilia. Hindwing 4.9 times as long as wide; marginal cilia slightly less than 0.2 the width of wing.



Plates 10–11. *Synopeas darwini* Buhl nov. spec., female. 10: Forewing; 11: Hind part of T2, T3–T6. Scale bar = 100 μ m (Plates 10) and = 10 μ m (Plate 11).

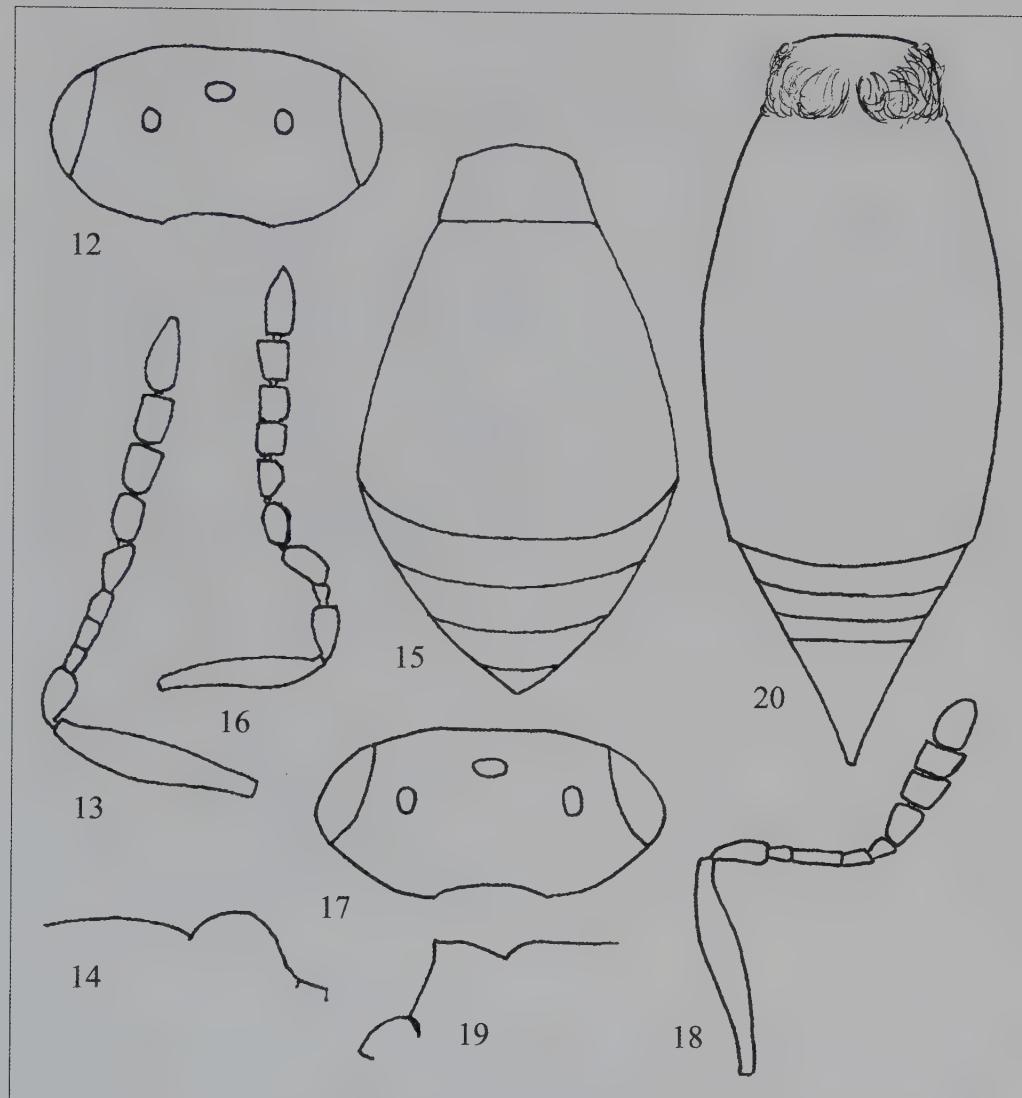
Metasoma (Plate 11, Fig. 20) 1.2 times as long as head and mesosoma combined, narrower than mesosoma (23:24), higher than wide (25:23). Wide hind margin of T2 and most of apical tergites with reticulate microsculpture; T3 with a couple of fine setae, T4–T5 each with a transverse row of about eight such setae. Apical third of sternite 2 reticulate.

Remarks: Scutellar groove much as in Mongolian *S. subtilis* Buhl, 2004, but this species has less transverse head with larger OOL than *S. darwini*, metasoma shorter and wider than high, and darker legs. *S. schwarzi* Buhl, 2009, is also similar to *S. darwini*, but it has shorter basal flagellar segments than *S. darwini*, scutellar tooth more upwards directed, smoother T6, and lighter antennae, cf. Buhl, 2004, 2009.

Etymology: Honouring Charles Darwin on the occasion of his 200th birthday.

Synopeas ubiquitosus Buhl, 2008

Specimens examined: Al-Ajban, 1♀, 30.i–26.ii.2006, MT; 1♀, 2–9.iv.2006, LT. N of Ajman, 1♀, 15–16.iii.2009, WT. Bithnah, 1♂, 3♀, 4–26.iii.2006, LT. Fujairah, 5♀, 8–29.iv.2006, LT. Khor al-Khwair, 1♀, 16–23.v.2007, LT. Near Mahafiz, 2♀, 2.ii–2.iii.2006, LT. Sharjah Desert Park, 3♀, 1–8.iv.2007,



Figures 12–20. 12–16, *Platygaster deserta* Buhl nov. spec. 12: Head from above; 13: Female, antenna; 14: Scutellum and propodeum in lateral view; 15: Female, metasoma from above; 16: Male, antenna. 17–20, *Synopeas darwini* Buhl nov. spec., female. 17: Head from above; 18: Antenna; 19: Scutellum and propodeum in lateral view; 20: Metasoma from above.

LT; 1♀, 14.ii–1.iv.2008, LT; 3♀, 1–6.iv.2008, LT; 1♀, 6–30.iv.2008, LT; 3♀, 30.iv–25.v.2008, LT. Sharjah-Khor Kalba, near tunnel, 3♂, 26.iv–3.v.2006, LT; 7♀, 3–18.v.2006, LT. Wadi Bih dam, 2♂, 4♀, 22–29.iii.2007, LT; 2♀, 6–13.vii.2007, LT; 11♀, 21–30.iv.2008, LT; 1♀, 30.iv–4.vi.2008, LT; 2♀, 25.ii–8.iii.2009, MT. Wadi Maidaq, 6–13.v.2006, LT; 1♀, 17–24.v.2006, LT; 5♂, 2♀, 20.ii–2.iii.2009, WT; 11♂, 1♀, 9–11.iii.2009, WT. Wadi Safad, 4♂, 5♀, 4–26.iii.2006, LT; 4♀, 26.iv–4.v.2006, LT. Wadi Shawkah, 1♀, 5–12.v.2007, WT. Wadi Wurayah farm, 1♂, 22.ii–2.iii.2009, LT; 1♀, 8–15.iii.2009, LT; 3♂, 3♀, 15–30.iii.2009, LT; 7♂, 8♀, 17–24.iii.2009, MT; 1♀, 24–30.iii.2009, MT.

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Order Hymenoptera, family Leucospidae

Christian Schmid-Egger

INTRODUCTION

The hymenopterous family Leucospidae belongs to the superfamily Chalcidoidea and is subdivided into 4 genera. In the Palaearctic region only the genus *Leucospis* Fabricius occurs; it has 109 species worldwide and 67 species in the Old World. The genus includes medium-sized to large wasps (6–15 mm) and represents the largest species of Chalcidoidea. *Leucospis* species have often a black and yellow colour pattern and a specially shaped female ovipositor. It is curved forwards above the metasoma, reaching the scutellum in some species. Black colour may be replaced by red, and yellow color by white. The hindfemora are markedly thickened, with a row of teeth below. Leucospidae are rather specialized in their host relations and develop as parasitoids in nests of Aculeate Hymenoptera. Most Palaearctic species parasitize solitary bees of the family Megachilidae.

The world species of Leucospidae have been revised by Bouček (1974). He listed only *Leucospis elegans* Klug, 1834, for Saudi Arabia and *Leucospis insularis* Kirby, 1900, from Socotra island. Other Leucospidae from Arabia are not known.

MATERIALS AND METHODS

This chapter is based on material collected by E. Sugden (deposited in the California State Collection of Arthropods, Sacramento, USA), by A. van Harten (deposited in the Canadian National Collection of Insects, Ottawa, Canada = CNC), and by the author during a trip to the UAE in March 2009 (deposited in the author's collection). The CNC also includes a few other specimens from the Arabian Peninsula, which are mentioned here. The systematic account follows that of Bouček (1974). Fifth tergite sensu Bouček (as used here) is the third visible tergite in dorsal view, because second and third tergites are hidden laterally.

SYSTEMATIC ACCOUNT

Leucospis elegans Klug, 1834

Plates 1–2

Specimens examined: Al-Ajban, 1♀, 2.4.2008, in Malaise-trap, leg. A. van Harten. Dubai, Nakhalai, 1♀, 24.iv.1984, in Malaise-trap, leg. E. Sugden; Dubai, al-Awir, 1♀, 26.v.1984, in Malaise-trap, leg. E. Sugden. Wadi Bih, 1♀, 1♂, 19.iii.2009, collected with hand-net, leg. C. Schmid-Egger. EGYPT: Oasis Al-Fayum, Birkat Qarun, 1♀, 25.ix.1992, collected with hand-net, leg. C. Schmid-Egger. OMAN: Muscat, 23°36'N 58°24'E, 1♀, 10.iv.1989, in Malaise-trap, leg. M. Gallagher. YEMEN: Lahj, 1♂, 1♀, 17.xii.2001–31.i.2002, in Malaise-trap, leg. A. van Harten & A. Sallam.

Remarks: The females from the UAE agree in morphology with the description of Bouček (1974) and with the examined female from Egypt. They differ in colour as follows: Scape completely reddish in one female (with yellow band in specimens from Egypt and remaining females), Tergum I reddish (with two oval yellow spots above in female from Egypt), pale gaster colour whitish-yellowish (lemon yellow in female from Egypt), and medial brownish spot on hind femur smaller than half hind femoral surface (larger than half surface in female from Egypt). In the specimens from Yemen, the black colour is completely replaced by light red. Ovipositor is just reaching hind margin of tergum I in all examined specimens. It is shorter according to the description of Bouček (1974).



Plates 1–2. *Leucospis elegans* Klug. 1: Female, 2: Male. Body length of both: 6 mm.

Distribution: Egypt, Sudan, Saudi Arabia, Pakistan (Bouček, 1974). New to the UAE, Oman and Yemen.



Plate 3. *Leucospis* aff. *namibica* Bouček, female, from Yemen.

***Leucospis* aff. *namibica* Bouček, 1974**

Plate 3

Specimens examined: YEMEN: Lahj, 2♀, 17.xii.2001-31.i.2002, in Malaise-trap, leg. A. van Harten & A. Sallam. BOTSWANA: Serowe, Farms Brigade, 1♀, x.1984, in Malaise-trap, leg. P. Forchhammer.

Remarks: The two examined females from Yemen key out to *namibica* in Bouček (1974) and agree with description in most characters. They mainly differ in lack of any pronotal carina. Black colour is partly replaced by red. Otherwise, the main characters are: ovipositor very short and just reaching horizontal surface of tergum V (= apical third of tergum V), latero-dorsal surface of hind coxa markedly striate with a smooth shiny area. Another female from Botswana also agrees with specimens from Yemen, and differs from the description of *namibica* by a completely black mesonotum. Also, the dorso-lateral surface of the hind coxa is microsculptured, not striate. Only type comparison and revision will reveal the true taxonomical state of the specimens from Yemen; provisionally they are treated as aff. *namibica*.

The finding of *namibica* or a closely related taxon in the Arabian Peninsula is unexpected, because it is known from Namibia only. On the other hand, such a distribution pattern (southern Africa – Arabia) is also known from other wasp species, eg. in Sphecoidea (Schmid-Egger, in preparation).

Distribution: Namibia (Bouček, 1974). New to Yemen and Botswana.

Leucospis vanharteni Schmid-Egger nov. spec.

Plates 4–7

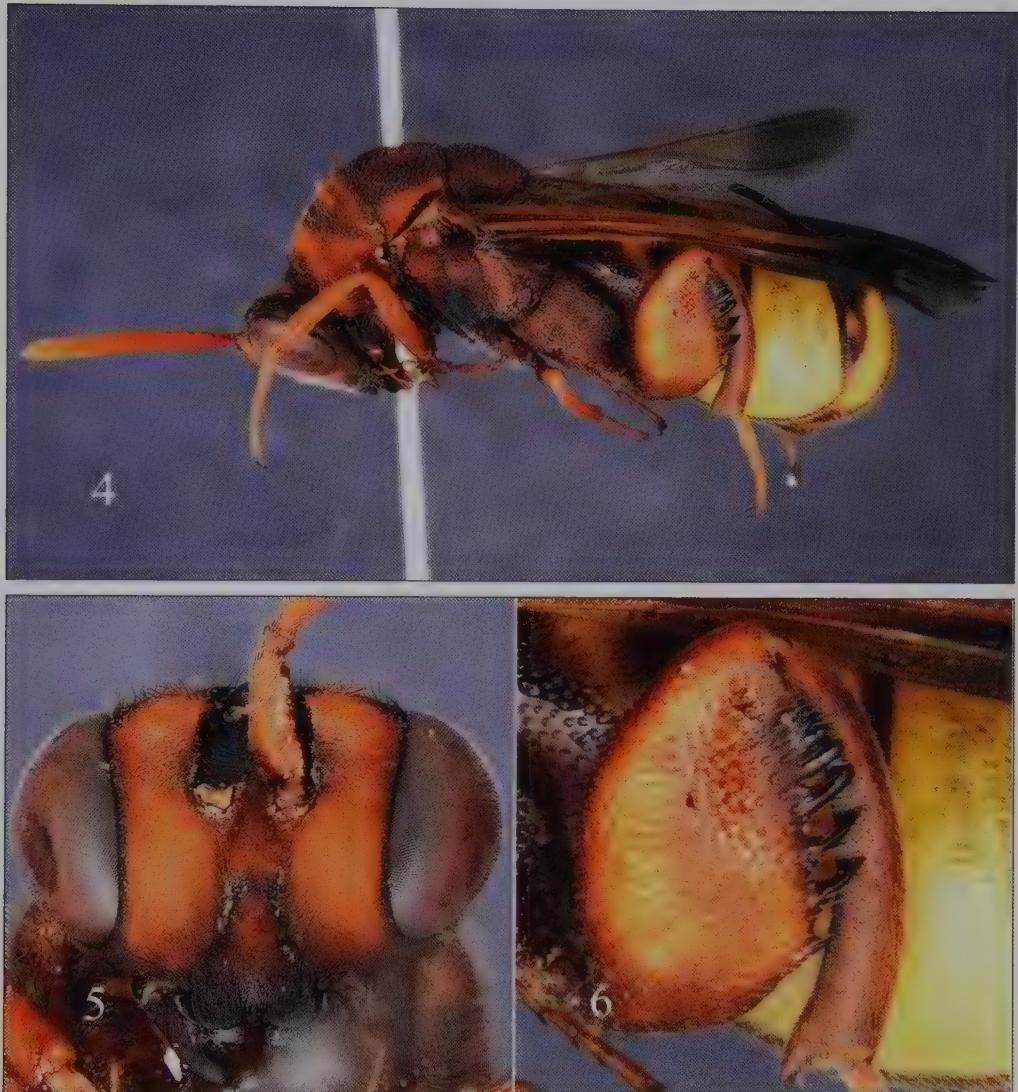
Specimens examined: Holotype: ♀, United Arab Emirates, Wadi Helo, near tunnel, 24°9'N 56°22'E, 19.iii.2009, collected with hand-net, leg. C. Schmid-Egger (deposited in Museum für Naturkunde Berlin, Germany).

Diagnosis: *Leucospis vanharteni* belongs to the *gigas* species group and the *miniata* subgroup sensu Bouček (1974). It is characterized by two weak pronotal cross-carinae, by a row of large hind femoral teeth, which are larger than basal tooth, and by a rounded metanotum (dorsellum). The metanotum is markedly bidentate in the related *L. gigas* subgroup. *Leucospis vanharteni* keys out with *miniata* in the key of Bouček (1974: 104). It differs from *L. miniata* by the following characters:

<i>Leucospis vanharteni</i>	<i>Leucospis miniata</i>
Colour pattern: Head and mesosoma all reddish, except upper head and lower mesopleuron. Abdomen: tergum I red with narrow yellow band, remaining terga all yellow.	Colour pattern: Head and mesosoma with a reddish or yellow colour pattern, leaving about 50% of surface black. Yellow or red bands of abdomen approximately half as wide as remaining black space.
Pronotum: Anterior transverse carina medially emarginated in contradistinction to posterior transverse carina. Minimal distance between both carinae less than diameter of hind ocellus.	Pronotum: Anterior transverse carina parallel to posterior transverse carina. Minimal distance between both carinae about one diameter of hind ocellus.
Metanotum (dorsellum) with indistinct transverse carinae in posterior third.	Metanotum evenly rounded.
Hind femur: Punctures of medial area $0.3\text{--}0.6 \times$ its diameter apart, interspaces shiny.	Hind femur: Punctuation dense, interspaces very small or invisible.

Another similar species is *L. incarnata* Westwood, 1839, from South Africa. It is characterized by a sparser punctuation, compared with *miniata*, and differs according to description of Bouček (1974) by colour pattern (terga with yellow spots only in *incarnata*, all yellow in *vanharteni*).

Description: Body length 11.5 mm. Colour: Head, antenna, mesosoma and legs orange reddish with the following parts black: Lower half of clypeus, apical half of mandible, lower part of mesopleuron, mesosternum, teeth on hind femur. Tergum I dark reddish except for a narrow yellow medial band, remaining terga yellow with brownish margin. Hind femur medially somewhat yellowish-reddish. Fore and hind wings yellowish with reddish venation, apical third strongly fuscous. Indentation above antennal socket, upper frons and orbit behind eyes in upper part black. Morphology: Clypeus produced, similar to *L. miniata* or *L. gigas*. Flagellomere I $0.85 \times$ as long as flagellomere II. Pronotum with two weakly expressed cross-carinae, anterior carina approximately the distance of one ocellar diameter apart from marginal carina, medially emarginated posteriorly. Metanotum with elevation, margin of punctures form a kind of cross-carina in apical forth, metanotum apically vertical. Propodeum medio-basally with short, longitudinal and rounded elevation. Ovipositor reaching apical forth of tergum I. Hind coxa evenly puncate. Hind femur with small basal triangular tooth (tooth I) and 6 longer apical teeth (teeth I–VII). Teeth II and III spine-like, remaining teeth apically truncate, tooth VI and VII connected. Hind tibia ending in a distinct tooth. Punctuation of terga I–III and of hind femur sparse, punctures on terga $0.1\text{--}0.5$ diameters apart, those of



Plates 4–6: *Leucospis vanharteni* nov. spec. 4: Holotype female, laterally; 5: Frons with clypeus; 6: Hindleg.

hind femur 0.3–0.6× diameters apart. Remaining terga with dense punctation, no interspaces visible.

Male unknown.

Discussion: *Leucospis vanharteni* differs from the closely related *Leucospis miniata* Klug, 1834, mainly by its colour pattern. *Leucospis miniata* occurs in a red and a yellow colour form. I could examine both (one red coloured female from Tunisia, two yellow coloured females from Israel). The colour pattern of both forms is more or less similar (see table below), and differs markedly from the colour pattern of *L. vanharteni*. Also, the punctuation of hind femur is sparser in *L. vanharteni* than in *L. miniata*. For other characters, see below.



Plate 7. *Leucospis vanharteni* nov. spec., right antenna.

Ecology: The specimen was collected by hand-netting on flowering *Ochradenus aucheri* (Resedaceae).

Distribution: Only known from the Hajar mountains in eastern UAE.

Derivatio nominis: The species is dedicated to Antonius van Harten, the coordinator of the UAE Insect Project.

Key to the Arabian species of *Leucospis*:

- 1 Pronotum with three distinct transverse carinae 2
- Pronotum with at most two transverse carinae, carinae less developed 3
- 2 Discal (basal) carina weak and straight, slightly lower than premarginal carina which may be slightly arcuate or angulate (Pubescence unusually long although thin; hind femur slender, pronotal sides converging, concave, ovipositor reaching hind fifth of first tergite which has distinct ovipositorial furrow in posterior third; medial teeth of hind femur small), Socotra *Leucospis insularis* Kirby (not treated here)
- Discal carina very strong, at least as high as the premarginal one and both distinctly angulate *Leucospis elegans* Klug
- 3 Middle teeth of hind femur distinctly longer than basal triangular tooth. Dorso-lateral surface of hind coxa evenly punctate. Female: Ovipositor reaching base of tergum I..... *Leucospis vanharteni* Schmid-Egger nov. spec.
- Middle teeth of hind femur shorter than basal triangular tooth. Dorso-lateral surface of hind coxa with longitudinal edge, above with smooth and shiny space, basally with fine striation. Female: Ovipositor much shorter, ending in apical third of tergum V..... *Leucospis aff. namibica* Bouček

ACKNOWLEDGEMENTS

I thank Hannes Baur from Bern, Switzerland for discussion of the new species. Dr. Martin Hauser and Dr. Stephen D. Gaimari kindly sent *Leucospis* specimens for examination from the California State Collection of Arthropods in Sacramento, USA, and Dr. Gary A.P. Gibson sent specimens from the Canadian National Collection of Insects, Ottawa, Canada.

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Order Hymenoptera, Chalcidoidea associated with figs (families Agaonidae and Pteromalidae)

Simon van Noort and Jean-Yves Rasplus

INTRODUCTION

Fig wasp is a loose term applied to the assemblage of broadly unrelated groups of Chalcidoidea that reproduce inside the enclosed inflorescence ‘fig’ of fig trees (*Ficus*, Moraceae). At one point these wasps were all included in the family Agaonidae (Bouček, 1988). Subsequent phylogenetic re-appraisal demonstrated the polyphyletic nature of Agaonidae and three subfamilies of non-pollinating fig wasps (Sycocinae, Otitesellinae and Sycoryctinae) were reassigned to the Pteromalidae. Family level affinities of the Sycophaginae and Epichrysomallinae are still unclear, but they do not belong in the Agaonidae, leaving only the pollinating fig wasps in the family (Rasplus et al., 1998; Campbell et al., 2000). In addition, there are representatives of the Eurytomidae and Ormyridae that are also associated with figs in the Old World (Bouček et al., 1981; Bouček, 1988; Compton & van Noort, 1992; Priyadarsanan 2000; Rasplus et al., 2003).

World fig wasp faunas are still poorly known at species level with, for example, a paltry 230 species described of an estimated 700–1000 species in the Afrotropical region (van Noort & Rasplus, 1997). No fig wasps have been recorded from the UAE (J. Noyes, Universal Chalcidoidea Database: <http://www.nhm.ac.uk/research-curation/projects/chalcidoids/>). Information for fig wasp species richness on the Arabian Peninsula is confined to a treatise of fig wasps collected during a survey of arthropods using light traps and Malaise traps conducted in Yemen by Antonius van Harten, during which twenty eight fig wasp species were recorded, although sixty species of fig wasp, of which 40% are undescribed, are estimated to occur in Yemen (van Noort & van Harten, 2006). Very few, if any, collections of fig wasps have been made by rearing specimens from their host figs anywhere in the Arabian Peninsula, which is unfortunate as this is the most efficient way of obtaining accurate baseline information on local fig wasp species richness, as long as sufficient sampling is carried out (van Noort & Compton, 1998).

From a biogeographical perspective the fig flora of the southern Arabian Peninsula has strongest affiliations with the flora of the Afrotropical region. Of the nine species occurring in Yemen, eight of these are centred in the Afrotropical region. The remaining species is centred on the Arabian Peninsula, extending into the horn of Africa and the western part of the Oriental region (van Noort & van Harten, 2006). The Yemen *Ficus* flora and consequently the associated fig wasp fauna can be largely considered to be components of the Afrotropical biota. UAE on the other hand is situated at higher latitude in the northern part of the Arabian Peninsula and as a result the country would be expected to have affinities with the Afrotropical, Oriental and Palaearctic faunal and floral assemblages.

Fig wasps develop solely in figs of the pan-tropical genus *Ficus* whose species richness, approximately 755 species worldwide, is centred in the tropics and declines with an increase in latitude in both hemispheres (van Noort & Rasplus, 2004–2010). Around 511 species occur in the Indo-Australasian region (Asia, Malaysia, Pacific islands and Australia) and approximately 132 species in the Neotropical region (Central and South America). In the Afrotropical region (Africa south of the Sahara, including Madagascar) there are currently 112 recognized species (van Noort & Rasplus, 2004–2010). *Ficus* species richness is highest in rainforest with countries in central Africa harbouring up to 62 species (van Noort et al.,

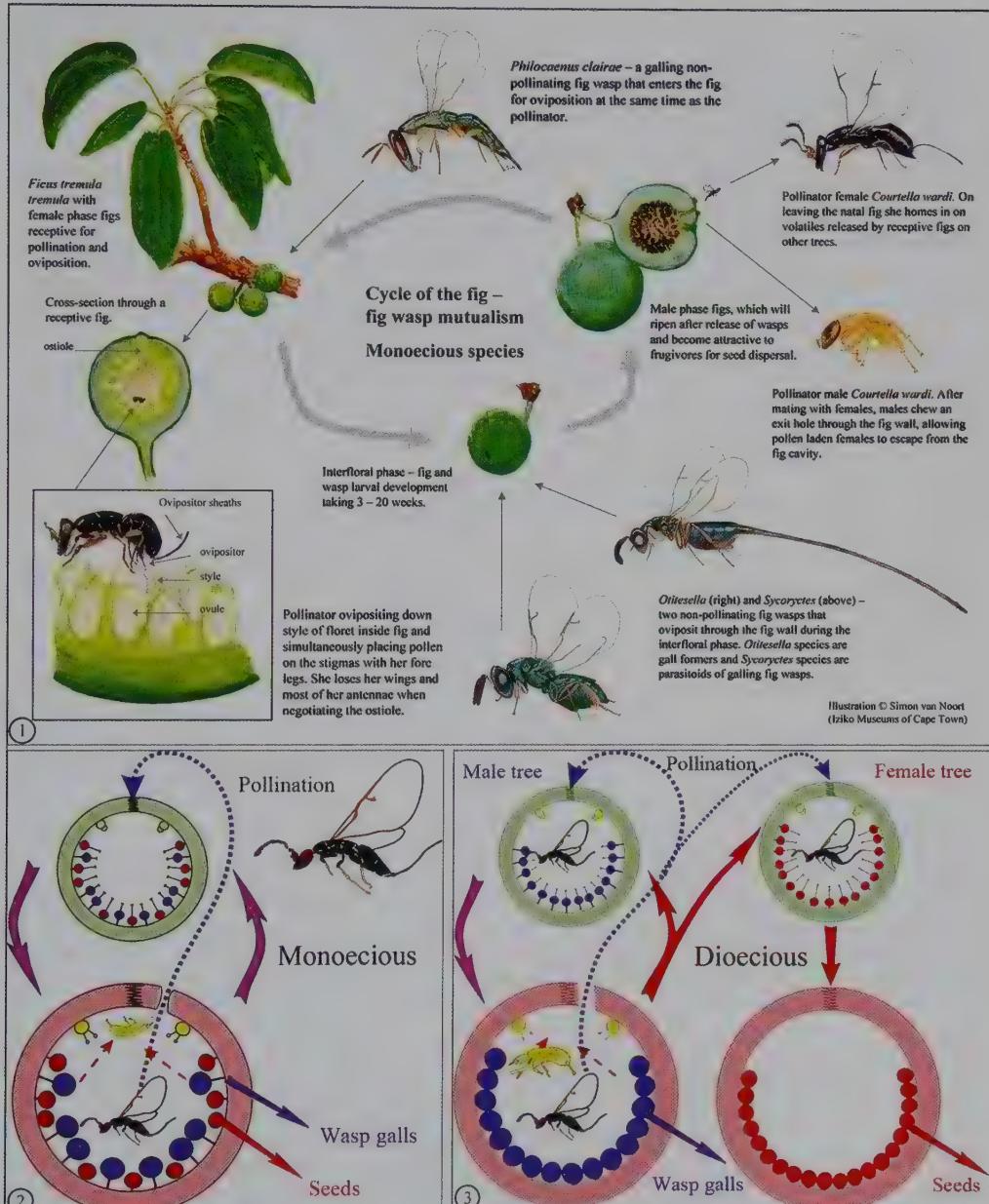
2007). Unsurprisingly, given the arid nature of the region, UAE has a depauperate fig flora with only two indigenous fig species restricted to rocky higher elevations: *Ficus salicifolia* [= *F. cordata salicifolia*] (common) and *F. johannis johannis* (uncommon) (Jongbloed, 2003). In addition, *Ficus palmata* and *Ficus carica* are cultivated on farms at higher elevation and *Ficus religiosa* has been introduced and planted (van Harten, pers. comm.). Based on the presence in UAE of the fig wasp species (the pollinator and a galler) associated with *Ficus microcarpa*, this fig species is likely to also have been introduced and planted, as it has been in many areas of the world (Beardsley, 1998; Bouček, 1993). Additionally two species of non-pollinating fig wasps associated with *Ficus sycomorus* were also collected, suggesting that this fig species may also be present. There is, however, the possibility that these fig wasp specimens were stragglers, having travelled from further south on the Arabian Peninsula where the host species is known to occur in Yemen (van Noort & van Harten, 2006). Fig wasps are capable of dispersing over hundreds of kilometers (Ahmed et al., 2009).

Biology of the mutualism

The obligate mutualism between pollinating fig wasps, and their host fig trees (*Ficus*, Moraceae) is an ancient relationship originating around 70–90 mya (Machado et al., 2001; Ronsted et al., 2005, 2008) and has historically been considered to be a one-to-one relationship (Ramirez, 1970; Wiebes, 1979; Wiebes & Compton, 1990). However, increasing evidence suggests the mutualism is not as tight as previously supposed, with records of more than one species of pollinator associated with a single host, and conversely, single pollinator species associated with more than one host fig species (Michaloud et al., 1996; Rasplus, 1996; Cook & Rasplus, 2003; Molbo et al., 2003; Zhang et al., 2004; Herre et al., 2008; Su et al., 2008; Peng et al., 2008). The evolutionary history of the association is highly complex and the extent of co-speciation between fig wasps and their host figs is only now starting to be teased apart (Jousselin et al., 2003b, 2006, 2008; Machado et al., 2005; Marussich & Machado 2007; Jackson et al., 2008). The mutualism (Plate 1) depends on the wasp providing a pollination service and the fig tree providing a breeding site for the pollinating wasp's progeny with neither partner being able to reproduce without the other (Galil, 1977; Janzen, 1979). The non-pollinating wasps are either phytophagous, galling the ovules as do the pollinators, or parasitoids, inquilines or klepto-parasitoids of the gall formers (Compton & van Noort, 1992; West & Herre, 1994; West et al., 1996; Kerdelhué & Rasplus, 1996a, 1996b; Compton et al., 2009).

The developmental cycle of the fig comprises a number of distinct but inter-connecting stages with fig wasp larval development correlating strongly with fig development (Galil, 1977) (Plate 1). The cycle may encompass anything from three to twenty weeks (Bronstein, 1992; Ware & Compton, 1994). Female fig wasps emerging from the fig they have developed in (Plate 8) need to locate new receptive figs to continue the reproductive cycle. Figs within a crop are often at the same stage of development, with the consequence that fig wasps may require a long distance flight of sometimes hundreds of kilometers to locate a tree with receptive figs for oviposition and pollination (Ahmed et al., 2009). These tiny wasps, averaging between one and two millimetres in length, achieve this remarkable feat by using upper air currents for dispersal and then dropping down into the boundary layer to home in on volatile chemicals released by the figs when they are receptive for pollination (van Noort et al., 1989; Hossaert-McKey et al., 1994; Ware & Compton, 1994a, 1994b; Grison-Pige et al., 2002; Borges, 2008).

Each fig has hundreds to thousands of tiny flowers lining the inside walls of the central cavity. The only link to the outside world is through a tiny bract-lined opening at the apex of



Plates 1–3. Biology of the fig – fig wasp mutualism. 1–2: Life cycle of a monoecious fig species. 3: Life cycle of a functionally dioecious fig species.

the fig, the ostiole, and it is by means of this passage that the pollinating fig wasp gains access to the florets (Plate 4). The pollinating wasps are uniquely adapted to squeeze their way through the ostiole, having evolved a flattened head and body and many rows of backward pointing mandibular teeth situated on the underside of the head. Once inside the fig

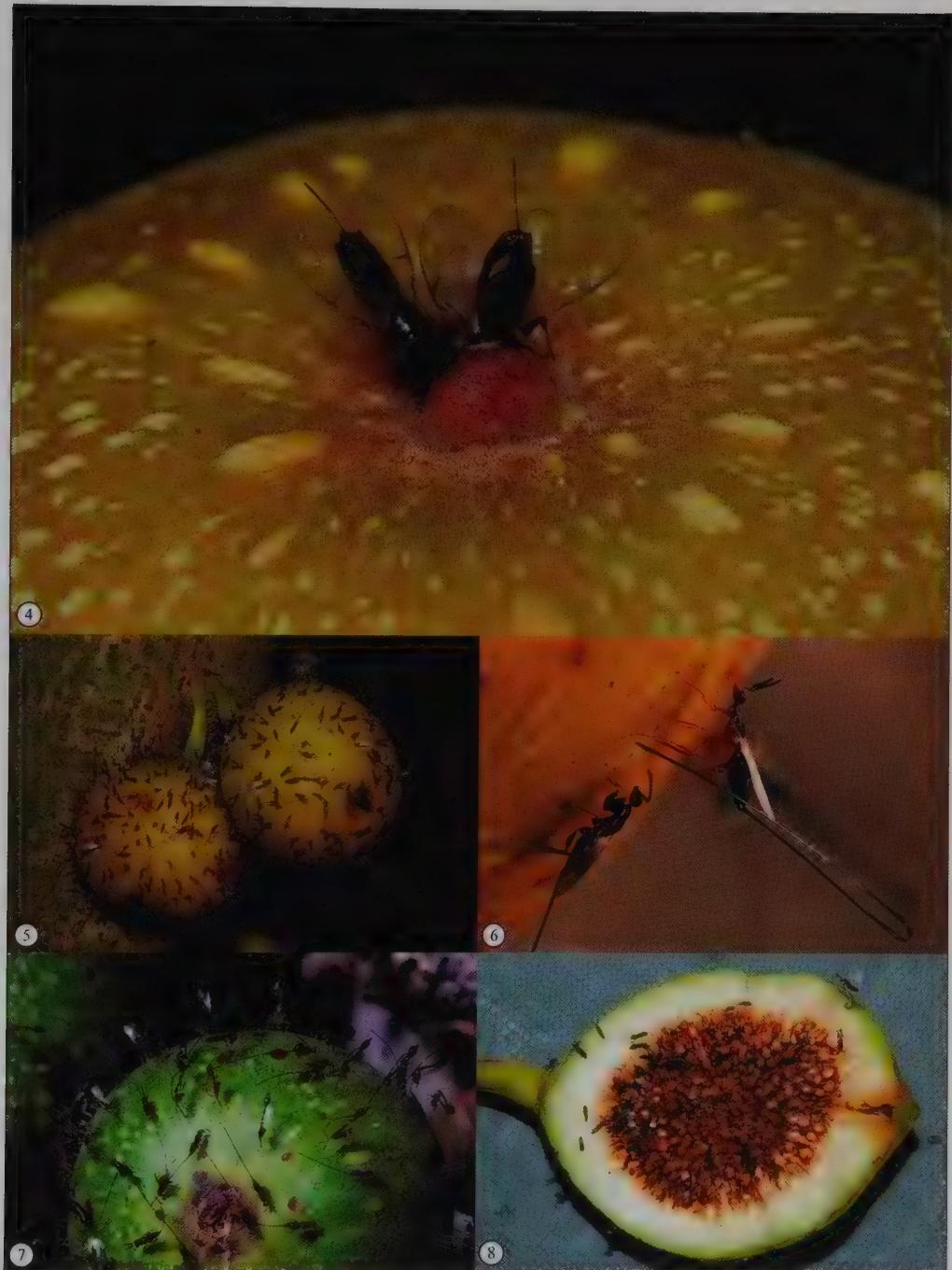
cavity, the female proceeds to unload pollen onto the stigmas and inserts her ovipositor down the style of the flower to oviposit within the ovule. The ovary swells up to form a gall and the wasp larvae feed on endosperm tissue in the galled ovary, which would otherwise have produced a seed (Verkerke, 1989; Herre & West, 1997).

Most of the non-pollinators oviposit through the fig wall from the outside of the fig at various stages of fig development (Kerdelhué & Rasplus, 1996a). A few non-pollinating fig wasps enter the fig through the ostiole and then exhibit convergent morphological adaptations with the pollinators (van Noort & Compton 1996). The externally ovipositing fig wasps often have extremely long ovipositors, the length of which is related to the wall thickness of their host fig (Plates 5–7). Fig size varies tremendously across species, and ranges from smaller than a marble to as large as a tennis ball. Towards the end of the fig developmental cycle, all the fig wasps breeding in a particular fig emerge from their galls within a short period of each other. Mating largely takes place within the confines of the fig before the males chew a hole through the fig wall to the exterior to allow the females to escape. Pollinator females actively or passively load up pollen from the ripe anthers before emerging from the fig to search for young receptive figs to complete the cycle (Jousselin et al., 2003a; Kjellberg et al., 2001).

Fig trees are keystone species providing a resource for a multitude of frugivorous and insectivorous animals (Compton et al., 1994; Shanahan et al., 2001; Kissling, 2007). Once the female fig wasps have left the fig (Plate 8), it ripens, changing colour and smell, and becomes attractive to seed or fruit eating birds, bats, monkeys and even lizards (Kalko et al., 1996; Whiting & Greeff, 1997; Borges et al., 2008). With their asynchronous phenology, fig trees provide an all year round production of figs, providing food in seasons when other fruiting species are not (Bronstein et al., 1990; Anstett et al., 1997). Frugivores play an important part in the propagation of fig trees, acting as the dispersal agents of the seeds (Shanahan et al., 2001).

Figs exhibit two life cycle strategies. About half of the 755 species are monoecious and the other half are gynodioecious (functionally dioecious with male and female reproductive functions separated between individual trees) (Kjellberg et al., 1987; Herre et al., 2008) (Plates 1–3). In monoecious species, which is likely to be the basal condition, both the female and male reproductive functions are contained in the same fig, but the female and the male reproductive phases are separated by anything up to 20 weeks (Plates 1–2) (Berg 1989; Herre, 1989; Machado et al., 2001). Pollinating fig wasps live for only a few days (Compton, 1993), with the result that pollen dispersal is carried out by the pollinator's offspring. Nevertheless, these tiny fig wasps are extremely effective pollen dispersers, ensuring gene flow over hundreds of kilometers (Ahmed et al., 2009).

In dioecious species the female and male reproductive functions are separated between individual trees (Plate 3). Male trees produce figs containing florets that all have a short style length (blue flowers in Plate 3) (Patel & Hossaert-McKey, 2000). The pollinating fig wasp is thus capable of reaching all the ovules with her ovipositor and hence often manages to lay eggs in all the flowers. These galled ovules then produce wasps, which load up pollen before they leave the fig they have bred in. Figs on these trees therefore perform the male reproductive function. Female trees produce figs that all have a long style (red flowers in Plate 3), preventing the pollinator from reaching the ovules with her ovipositor, which is much shorter than the style length. She does, however, pollinate the stigmas in the process of attempting to lay her eggs. These flowers set seed performing the female reproductive function for the species (Plate 3). Figs on female trees are traps for the wasps as they do not manage to reproduce in these figs (Kerdelhue & Rasplus, 1996b; Kjellberg et al., 1987; Ramirez, 1969; Wiebes, 1979). They are, however, unable to discern between male and female figs and hence are fooled into entering female figs (Plate 3). Female figs mimic male



Plates 4–8. Biology of the fig – fig wasp mutualism. 4: Pollinator females squeezing their way through the fig ostiole to gain access to the fig cavity for oviposition and pollination. 5–7: Non-pollinators (*Sycoryctinae*) ovipositing through the fig wall. 8: Fig split open to reveal fig wasps emerging from their natal galls.

figs in terms of size, colour and most importantly the chemical cues or volatiles that the pollinators home in on (Borges, 2008; Grison-Pige et al., 2002). For a more detailed overview of the evolutionary ecology of this fascinating interaction see Weiblen (2002) and Herre et al. (2008).

In this paper we detail the species richness of fig wasps of the UAE, mostly based on light trap collections, but a few records from Malaise trap collections. A summary of expected *Ficus* and fig wasp species richness is provided for the country. Links to further information and images of UAE fig wasps and figs is available online at FigWeb:
http://www.figweb.org/Fig_wasps/Checklists/United_Arab_Emirates_fig_wasps.htm. The fig tree species present in the UAE have a distribution that is broader than the Arabian Peninsula, and hence, the UAE is unlikely to support any endemic fig wasps.

MATERIALS AND METHODS

Fig wasps were collected by A. van Harten mostly in light traps with a few emanating from Malaise traps or pan traps. Individuals were preserved in ethanol. Specimens were chemically dried using Hexamethyldisilizane (HMDS) (Brown, 1993; Heraty & Hawks, 1998) before being point-mounted on black, acid-free card for examination, photography and long term preservation. Specimens are deposited in Iziko South African Museum (SAMC), Jean-Yves Rasplus collection (JYRC) and the United Arab Emirates Invertebrate Collection (UAEIC). Images were acquired using the EntoVision multiple-focus imaging system. This system comprises a Leica M16 microscope with a JVC KY-75U 3-CCD digital video camera attached that fed image data to a notebook computer. The program Cartograph 5.6.0 was then used to merge an image series into a single in-focus image. Lighting was achieved using techniques summarized in Buffington et al. (2005), Kerr et al. (2009) and Buffington & Gates (2009). The images included in this paper are available through FigWeb:

http://www.figweb.org/Fig_wasps/Checklists/United_Arab_Emirates_fig_wasps.htm.

Abbreviations used: NARC = National Avian Research Centre; LT = light trap; MT = Malaise trap; WT = water trap; AvH = leg. A. van Harten.

Overview of fig species in the UAE and possibly associated wasps.

Fig tree species recorded from, or potentially occurring in the UAE (after Jongbloed, 2003; Berg, 1990; Berg & Wiebes, 1992; and based on fig wasp records in this paper). Nomenclature is updated according to Burrows & Burrows (2003). The list includes the predicted associated fig wasp fauna for each *Ficus* species based on collections made elsewhere in the Afrotropical and Oriental regions. The described fig wasp species that were recorded during the survey in the UAE are indicated in bold text.

Genus *Ficus*

Subgenus *Ficus*

Section *Ficus*

1. *Ficus palmata* (Ethiopia to India & Nepal)

Blastophaga psenes (Linnaeus, 1758) (Cosmopolitan)

Sycoscapter forsteni (Joseph, 1957) (India)

Philotrypesis palmata Joseph, 1954 (India)

2. *Ficus carica*

Blastophaga psenes (Linnaeus, 1758) (Cosmopolitan)

3. *Ficus johannis johannis**Blastophaga psenes* (Linnaeus, 1758) (Cosmopolitan)Subgenus ***Sycomorus*****4. *Ficus sycomorus sycomorus****Ceratosolen arabicus* Mayr, 1906 (throughout Afrotropical region)*Ceratosolen galili* Wiebes, 1964 (throughout Afrotropical region)*Sycophaga sycomori* (Linnaeus, 1758) (Egypt, Eritrea, Ethiopia, Kenya, Namibia, Senegal, South Africa, Tanzania, UAE, Yemen)*Idarnes gracile* Wiebes, 1968 (Kenya)*Eukoebela sycomori* Wiebes, 1968 (Ethiopia, Kenya, Namibia, Senegal, South Africa, Tanzania, Yemen)*Apocryptophagus gigas* (Mayr, 1906) (Ethiopia, Kenya, Senegal, South Africa, Tanzania, Yemen)*Apocrypta longitarsus* (Mayr, 1906) (Botswana, Cameroon, Eritrea, Ethiopia, Kenya, Malawi, Namibia, Senegal, South Africa, Tanzania, Zambia, Zimbabwe, UAE, Yemen)*Sycoscapter bambeyi* (Risbec, 1951) (Senegal)*Sycomacophila gibernau* Rasplus 2003 (Cameroon)*Ficomila gambiensis* (Risbec, 1955) (Gambia, South Africa, Zimbabwe)*Syceurytoma ficus* Bouček, in Bouček et al., 1981 (South Africa, Uganda, Zimbabwe)*Sycophila naso* Bouček, in Bouček et al., 1981 (Namibia, Uganda, Zimbabwe)Subgenus ***Urostigma***Section ***Urostigma*****5. *Ficus salicifolia****Platyscapa awekei* Wiebes, 1977 (Botswana, Ethiopia, South Africa, Tanzania, UAE, Yemen, Zimbabwe)*Otiesella serrata* Mayr, 1885 (Socotra, Yemen)*Otiesella pseudoserrata* van Noort, 1997 (Botswana, Ethiopia, South Africa, Tanzania, UAE, Zimbabwe)**6. *Ficus religiosa****Platyscapa quadraticeps* Mayr, 1885 (India, Iraq, Israel, Singapore, Sri Lanka, Taiwan. Also introduced to South Africa, UAE, Zambia)Possibly *Platyscapa frontalis* Motschulsky, 1863 (Sri Lanka, UAE)**7. *Ficus microcarpa****Eupristina verticillata* Waterston, 1921 (Cosmopolitan, including the UAE)*Philotrypesis taiwanensis* Chen, 1999 (Taiwan)*Philotrypesis okinavensis* Ishii, 1934 (China, Japan, Taiwan)*Philotrypesis emeryi* Grandi, 1926 (China, Hong Kong, Indonesia, Japan, Taiwan, USA)*Sycoscapter gajimaru* (Ishii) 1934 (China, Japan, Malaysia, Taiwan)*Sycoryctes moneres* Chen, 1999 (Taiwan)*Walkerella kurandensis* Bouček, 1988 (Australia, India, Taiwan)*Micranisa degastris* Chen, 1999 (Taiwan)*Odontofroggatia ishii* Wiebes, 1980 (China, Malaysia, Papua New Guinea, Taiwan, USA)*Odontofroggatia gajimaru* Ishii, 1934 (China, Japan, Malaysia, Taiwan)

- Odontofroggattia corneri* Wiebes, 1980 (China, Malaysia, Papua New Guinea, Solomon Islands, Taiwan)
Odontofroggattia galili Wiebes, 1980 (Cosmopolitan)
Eufroggattisca okinavensis Ishii, 1934 (China, Japan, Taiwan)
Acophila microcarpa Chen, 1999 (Taiwan, UAE)
Meselatus bicolor Chen, 1999 (Taiwan)
Bruchophagus sensoriae Chen, 1999 (Taiwan)
Sycophila petiolata Chen, 1999 (Taiwan)
Sycophila maculajacies Chen, 1999 (Taiwan)
Sycophila curta Chen, 1999 (Taiwan)
Ormyrus lini Chen, 1999 (Taiwan)

SYSTEMATIC ACCOUNT

Family Agaonidae

Genus *Blastophaga* Gravenhorst, 1829

Blastophaga psenes (Linnaeus, 1758)

Specimens examined: None collected, but the species is the pollinator of *Ficus carica*, *F. palmata* and *F. johannis*, all of which occur in the UAE.

Distribution: Cosmopolitan, originally Mediterranean, but introduced to many parts of the world.

Genus *Platyscapa* Motschulsky, 1863

Platyscapa frontalis Motschulsky, 1863 (type species of *Platyscapa*)

Plates 9–14

Specimens examined: Al-Ajban, 2♀, 9.xi–7.xii.2005, LT & MT, AvH. Fujairah, 1♀, 6.iv–2.v.2005; 3♀, 28.ii–1.iv.2006, LT, AvH. Sharjah, 1♀, 1–31.i.2005, LT, AvH. Sharjah Desert Park, 1♀, 29.iii–6.iv.2005; 5♀, 6–30.iv.2005; 1♀, 25.ii–25.iii.2006; all LT, AvH. NARC, near Sweihan, 1♀, 14.iii–2.iv.2005; 2♀, 26.ii–2.iv.2006; all LT, AvH.

Comments: This is the first time this species has been collected since the type specimen was collected in Sri Lanka in the late eighteen hundreds. The holotype is in a poor state of preservation. *Platyscapa frontalis* is the type species of the genus *Platyscapa*.

Distribution: Sri Lanka and UAE. Type locality: Sri Lanka, Mts Patannas.

Host fig: Possibly associated with *Ficus religiosa*.

Platyscapa quadraticeps Mayr, 1885

Plates 15–20

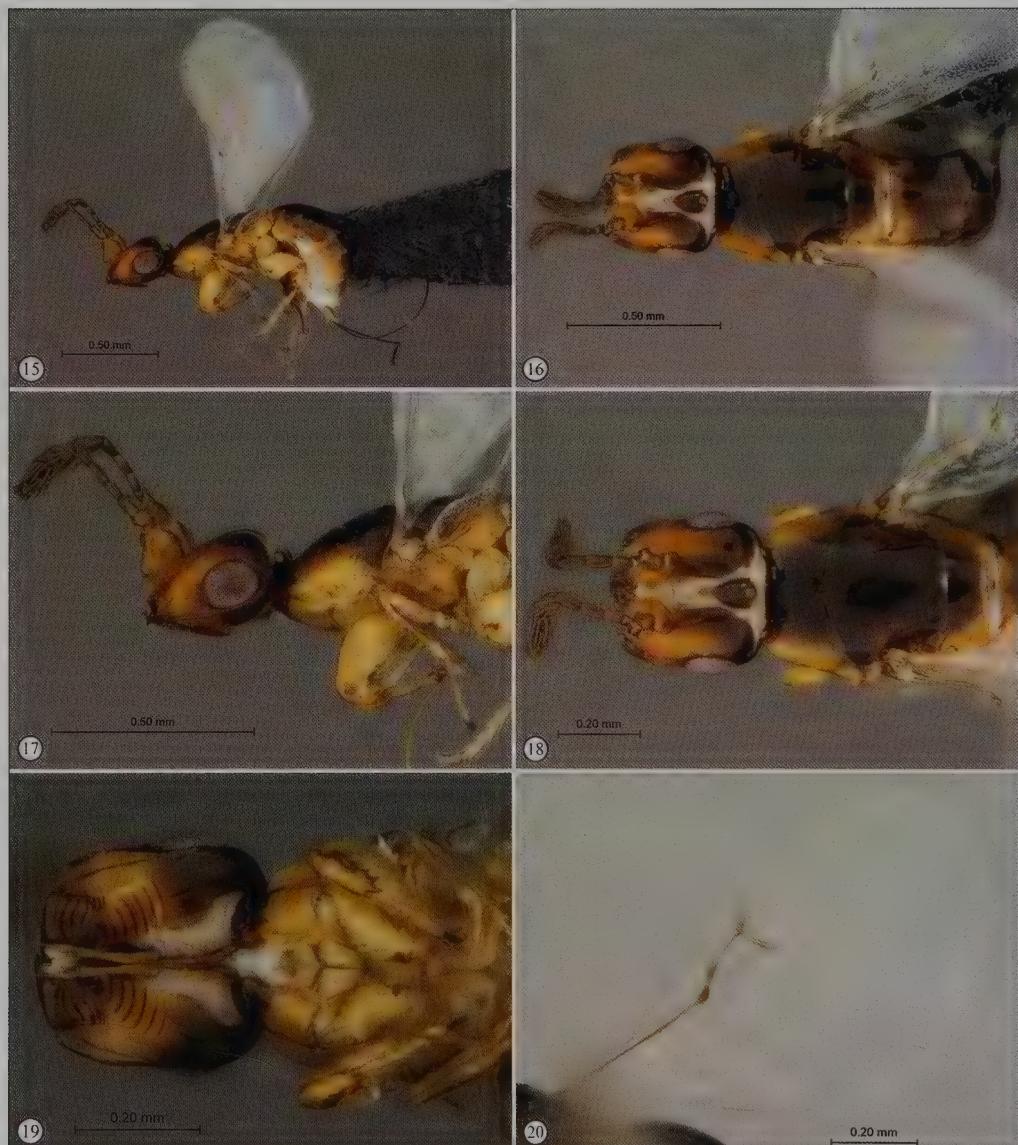
Specimens examined. Al-Ajban, 1♀, 9.xi–07.xii.2005, LT & MT, AvH. Fujairah, 3♀, 16–24.ii.2005; 14♀, 5.iii–6.iv.2005; 3♀, 2.v–5.vi.2005; 4♀, 8–19.xii.2005; all LT, AvH. Sharjah, 5♀, 1–31.i.2005; 36♀, 12–28.vi.2005; all LT, AvH. Sharjah Desert Park, 1♀, 25.i–22.ii.2005; 4♀, 21–29.iii.2005; 1♀, 20.x–8.xi.2005; 4♀, 13.xi–11.xii.2005; 6♀, 25.ii–25.iii.2006; 4♀, 11.xii.2005–18.i.2006; all LT, AvH. Sharjah-Khor Kalba, near tunnel, 1♀, 7–22.iii.2006, LT, AvH. NARC, near Sweihan, 1♀, 26.ii–2.iv.2006, LT, AvH. Wadi Safad, 133♀♀, 15–22.iv.2006, LT, AvH.

Distribution: India, Iraq, Israel, Singapore, Sri Lanka, Taiwan. Also introduced to South Africa, Zambia, and UAE. Type locality: Singapore.

Host fig: *Ficus religiosa*.



Plates 9–14. *Platyscapa frontalis* Motschulsky. 9: Habitus, lateral view. 10: Body, dorsal view. 11: Head, mesosoma, lateral view. 12: Head, mesosoma, dorsal view. 13: head, mesosoma, ventral view. 14: Forewing. Scale bars in millimeters.



Plates 15–20. *Platyscapa quadraticeps* Mayr. 15: Habitus, lateral view. 16: body, dorsal view. 17: Head, mesosoma, lateral view. 18: Head, mesosoma, dorsal view. 19: Head, mesosoma, ventral view. 20: Forewing. Scale bars in millimeters.

Platyscapa awekei Wiebes, 1977

Plates 21–26

Specimens examined. Fujairah, 1♀, 5.iii–6.iv.2005; 1♀, 6.iv–2.v.2005; 1♀, 5.vi–2.vii.2005; 4♀, 28.ii–01.iv.2006, all LT, AvH. Hatta, 5♀, 8–26.iv.2006, LT, AvH. Sharjah, 4♀, 28.vi–23.vii.2005, LT, AvH. Sharjah Desert Park, 2♀, 20.x–8.xi.2005, LT, AvH. NARC, near Sweihan, 1♀, 26.ii–2.iv.2006, LT, AvH. Wadi Safad, 39♀, 31.i–21.ii.2006; 9♀, 1–8.vii.2006; 58♀, 20.xii.2005–2.i.2006; all LT, AvH. Wadi Wurayah, 11♀, 12–14.iv.2005, MT & WT, leg. T. Pape.

Distribution: Botswana, Ethiopia, South Africa, Tanzania, Yemen, Zimbabwe and UAE.
Type locality: Ethiopia.

Host fig: *Ficus salicifolia*.

Genus ***Eupristina*** Saunders, 1882***Eupristina verticillata*** Waterston, 1921

Plates 27–32

Specimens examined: Al-Ajban, 1♀, 9.xi–07.xii.2005, LT & MT, AvH. Fujairah, 5♀, 5.iii–6.iv.2005; 1♀, 6.iv–2.v.2005; 1♀, 2.v–5.vi.2005; 1♀, 8–19.xii.2005; 30♀, 28.ii–1.iv.2006; all LT, AvH. Sharjah, 9♀, 1–31.i.2005; 4♀, 27.iv–5.vi.2005; 3♀, 12–28.vi.2005; 2♀, 28.vi–23.vii.2005; all LT, AvH. Sharjah Desert Park, 4♀, 25.i–22.ii.2005; 7♀, 21–29.iii.2005; 2♀, 20.x–8.xi.2005; 6♀, 13.xi–11.xii.2005; 26♀, 25.ii–25.iii.2006; 16♀, 11.xii.2005–18.i.2006; all LT, AvH. Sharjah-Khor Kalba, near tunnel, 4♀, 7–22.iii.2006, LT, AvH. NARC, near Sweihan, 1♀, 14.iii–2.iv.2005; 1♀, 11–21.v.2005; 4♀, 16.xi–21.xii.2005; 20♀, 26.ii–2.iv.2006; all LT, AvH. Wadi Safad, 2♀, 31.i–21.ii.2006, LT, AvH.

Distribution: Cosmopolitan, including UAE. Type locality: Malaysia, Sarawak.

Host fig: *Ficus religiosa*.

Family **Pteromalidae**Subfamily **Sycoryctinae** Wiebes, 1966Genus ***Sycoscapter*** Saunders, 1883***Sycoscapter* spec.**

Plates 33–38

Specimens examined. Fujairah, 1♀, 5.iii–6.iv.2005; 2♀, 2.v–5.vi.2005; all LT, AvH. Sharjah, 3♀, 1–31.i.2005; 1♀, 27.iv–5.vi.2005; 17♀, 12–28.vi.2005; 13♀, 28.vi–23.vii.2005; all LT, AvH. Sharjah Desert Park, 1♀, 21–29.iii.2005; 1♀, 29.iii–6.iv.2005; 1♀, 13.xi–11.xii.2005; all LT, AvH. NARC, near Sweihan, 2♀, 14.iii–2.iv.2005; 1♀, 16.xi–21.xii.2005; 1♀, 26.ii–02.iv.2006; all LT, AvH. Wadi Safad, 1♀, 31.i–21.ii.2006, LT, AvH..

Distribution: UAE, but is likely to be more widespread.

Host fig: Unknown.

Genus ***Sycorcytes*** Mayr, 1885***Sycorcytes* spec. 1**

Plates 39–44

Specimens examined. Fujairah, 2♀, 8.ii–01.iv.2006, LT, AvH. Sharjah Desert Park, 3♀, 20.x–8.xi.2005, LT, AvH. Wadi Safad, 28♀, 31.i–21.ii.2006; 23♀, 15–22.iv.2006; 1♀, 1–8.vii.2006; 14♀, 20.xii.2005–2.i.2006, all LT, AvH. Wadi Wurayah, 3♀, 12–14.iv.2005, LT & WT, leg. T. Pape.

Distribution: UAE, but is likely to be more widespread.

Host fig: Unknown.

Genus ***Sycoscapteridea*** Ashmead, 1904



Plates 21–26. *Platyscapa awekei* Wiebes. 21: Habitus, lateral view. 22: Body, dorsal view. 23: Head, mesosoma, lateral view. 24: Head, mesosoma, dorsal view. 25: Head, mesosoma, ventral view. 26: Forewing. Scale bars in millimeters.



Plates 27–32. *Eupristina verticillata* Waterston. 27: Habitus, lateral view. 28: Body, dorsal view. 29: Head, mesosoma, lateral view. 30: Head, frontal view. 31: Head, ventral view. 32: Forewing. Scale bars in millimeters.



Plates 33–38. *Sycoscapter* species. 33: Habitus, lateral view. 34: Body, dorsal view. 35: Head, mesosoma, lateral view. 36: Head, mesosoma, dorsal view. 37: Head, frontal view. 38: Forewing. Scale bars in millimeters.



Plates 39–44. *Sycoryctes* species 1. 39: Habitus, lateral view. 40: Body, dorsal view. 41: Head, mesosoma, lateral view. 42: Head, mesosoma, dorsal view. 43: Head, frontal view. 44: Forewing. Scale bars in millimeters.

***Sycoscapteridea* spec. 1**

Plates 45–50

Specimens examined. Sharjah, 19♀, 12–28.vi.2005, LT, AvH. Sharjah Desert Park, 1♀, 21–29.iii.2005; 1♀, 6–30.iv.2005; all LT, AvH.

Comments: This species is probably conspecific with what is currently known as *Sycoscapteridea monolifera* Westwood, 1883 (associated with *Ficus religiosa*). Re-evaluation of sycoryctine generic delimitation is currently in progress.

Distribution: UAE, but is likely to be more widespread.

Host fig: Possibly associated with *Ficus religiosa*.

Genus ***Philotrypesis*** Förster, 1878***Philotrypesis* spec. 1**

Plates 51–56

Specimens examined: Fujairah, 1♀, 2.v–5.vi.2005; 1♀, 28.ii–1.iv.2006; all LT, AvH. Sharjah, 2♀, 1–31.i.2005; 1♀, 27.iv–5.vi.2005; 13♀, 12–28.vi.2005; 4♀, 28.vi–23.vii.2005; all LT, AvH. Sharjah Desert Park, 2♀, 21–29.iii.2005; 1♀, 29.iii–6.iv.2005; 1♀, 6–30.iv.2005; 1♀, 20.x–8.xi.2005; 1♀, 11.xii.2005–18.i.2006; all LT, AvH. NARC, near Sweihan, 6♀, 16.xi–21.xii.2005; 1♀, 26.ii–2.iv.2006, LT, AvH.

Distribution: UAE, but is likely to be more widespread.

Host fig: Unknown.

***Philotrypesis* spec. 2**

Plates 57–62

Specimens examined: Sharjah, 4♀, 12–28.vi.2005, LT, AvH.

Distribution: UAE, but is likely to be more widespread.

Host fig: Unknown.

***Philotrypesis* spec. 3**

Plates 63–68

Specimens examined: Fujairah, 2♀, 5.vi–2.vii.2005; 2♀, 28.ii–1.iv.2006; all LT, AvH. Sharjah, 1♀, 28.vi–23.vii.2005, LT, AvH. Sharjah Desert Park, 1♀, 6–30.iv.2005; 1♀, 31.v–30.vi.2005; all LT, AvH. Wadi Safad, 86 ♀♀, 31.i–21.ii.2006; 19♀, 15–22.iv.2006; 2♀, 1–8.vii.2006; 77♀, 20.xii.2005–2.i.2006, all LT, AvH.

Distribution: UAE, but is likely to be more widespread.

Host fig: Unknown.

***Philotrypesis* spec. 4**

Plates 69–74

Specimens examined: Fujairah, 1♀, 2.v–5.vi.2005, LT, AvH. Sharjah, 1♀, 27.iv–5.vi.2005; 9♀, 12–28.vi.2005; 3♀, 28.vi–23.vii.2005; all LT, AvH. NARC, near Sweihan, 1♀, 16.xi–21.xii.2005, LT, AvH.

Distribution: UAE, but is likely to be more widespread.

Host fig: Unknown.

Genus ***Apocrypta*** Coquerel, 1855***Apocrypta longitarsus*** Mayr, 1906

Plates 75–80

Specimens examined: Sharjah-Khor Kalba, near tunnel, 1♀, 7–22.iii.2006, LT, AvH. Wadi Safad, 1♀, 31.i–21.ii.2006, LT, AvH.

Distribution: Botswana, Cameroon, Eritrea, Ethiopia, Kenya, Malawi, Namibia, Senegal, South Africa, Tanzania, Zambia, Zimbabwe, UAE, Yemen.

Host fig: *Ficus sycomorus*.



Plates 45–50. *Sycoscapteridea* species 1. 45: Habitus, lateral view. 46: Body, dorsal view. 47: Head, mesosoma, lateral view. 48: Head, mesosoma, dorsal view. 49: Head, frontal view. 50: Forewing. Scale bars in millimeters.



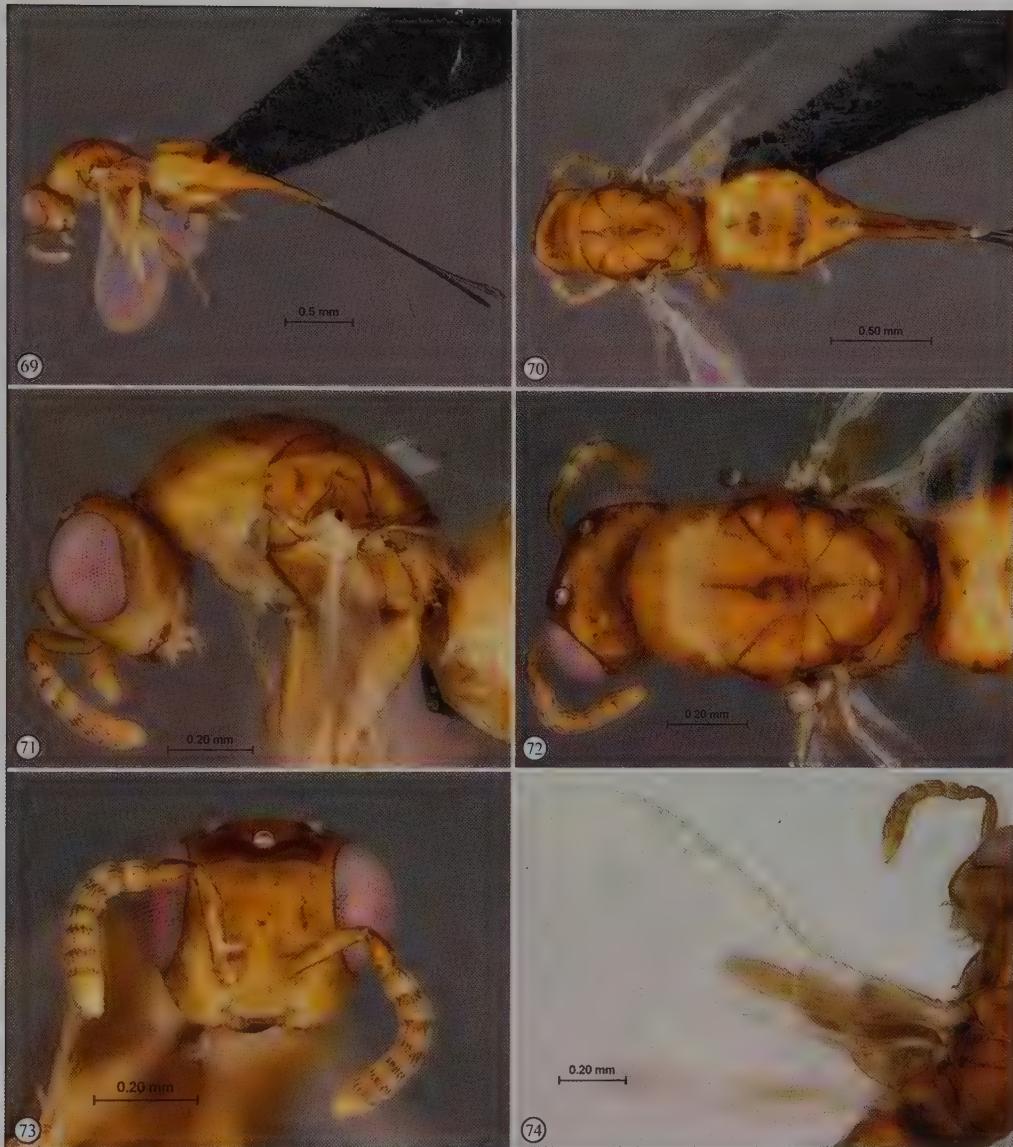
Plates 51–56. *Philotrypesis* species 1. 51: Habitus, lateral view. 52: Body, dorsal view. 53: Head, mesosoma, lateral view. 54: Head, mesosoma, dorsal view. 55: Head, frontal view. 56: Forewing. Scale bars in millimeters.



Plates 57–62. *Philotrypesis* species 2. 57: Habitus, lateral view. 58: Body, dorsal view. 59: Head, mesosoma, lateral view. 60: Head, mesosoma, dorsal view. 61: Head, frontal view. 62: Forewing. Scale bars in millimeters.



Plates 63–68. *Philotrypesis* species 3. 63: Habitus, lateral view. 64: Body, dorsal view. 65: Head, mesosoma, lateral view. 66: Head, mesosoma, dorsal view. 67: Head, frontal view. 68: Forewing. Scale bars in millimeters.



Plates 69–74. *Philotrypesis* species 4. 69: Habitus, lateral view. 70: Body, dorsal view. 71: Head, mesosoma, lateral view. 72: Head, mesosoma, dorsal view. 73: Head, frontal view. 74: Forewing. Scale bars in millimeters.



Plates 75–80. *Apocrypta longitarsus* (Mayr). 75: Habitus, lateral view. 76: Body, dorsal view. 77: Head, mesosoma, lateral view. 78: Head, mesosoma, dorsal view. 79: Head, frontal view. 80: Forewing. Scale bars in millimeters.

Subfamily **Otitesellinae** Joseph, 1964Genus ***Otitesella*** Westwood, 1883***Otitesella pseudoserrata*** van Noort, 1997

Plates 81–86

Specimens examined: Wadi Safad, 1♀, 20.xii.2005–2.i.2006; 1♀, 31.i–21.ii.2006; 1♀, 20.xii.2005–2.i.2006; all LT, AvH.

Distribution: Botswana, Ethiopia, South Africa, Tanzania, Yemen, Zimbabwe and UAE.

Type locality: South Africa, Kruger National Park, Pretoriuskop.

Host fig: *Ficus salicifolia*.

Subfamily **Sycophaginae** Walker, 1875Genus ***Sycophaga*** Westwood, 1840***Sycophaga sycomori*** (Linnaeus, 1758)

Plates 87–92

Specimens examined: Sharjah-Khor Kalba, near tunnel, 1♀, 7–22.iii.2006, LT, AvH.

Distribution: Egypt, Eritrea, Ethiopia, Kenya, Namibia, Senegal, South Africa, Tanzania, UAE, Yemen.

Host fig: *Ficus sycomorus*.

Subfamily **Epichrysomallinae** Hill & Riek, 1967Genus ***Acophila*** Ishii, 1834***Acophila microcarpa*** Chen, 1999

Plates 93–98

Specimens examined: Sharjah, 1♂, 1–31.i.2005; 1♀ (metasoma missing), 12–28.vi.2005; both LT, AvH.

Distribution: Taiwan.

Host fig: *Ficus microcarpa*.

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Antonius van Harten has dedicated an immense amount of energy to the inventory of invertebrates from poorly known regions of the Arabian Peninsula. Sampling and subsequent processing of resultant material is a resource-sapping commitment and his efforts have been suitably lauded in numerous publications contained in 'Fauna of Arabia' and the current series on Arthropods of the UAE. This material is based upon work supported by the South African National Research Foundation grant GUN 61497 to S. van Noort.

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Plates 81–86. *Otiesella pseudoserrata* van Noort. 81: Habitus, lateral view. 82: Body, dorsal view. 83: Head, mesosoma, lateral view. 84: Head, mesosoma, dorsal view. 85: Head, frontal view. 86: Forewing. Scale bars in millimeters.



Plates 87–92. *Sycophaga sycomori* Linnaeus. 87: Habitus, lateral view. 88: Body, dorsal view. 89: Head, mesosoma, lateral view. 90: Head, mesosoma, dorsal view. 91: Head, frontal view. 92: Forewing. Scale bars in millimeters.



Plates 93–98. *Acophila ?microcarpa* Chen. 93: Habitus, lateral view. 94: Body, dorsal view. 95: Head, mesosoma, lateral view. 96: Head, mesosoma, dorsal view. 97: Head, frontal view. 98: Forewing. Scale bars in millimeters.

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Order Hymenoptera, family Figitidae

Matthew L. Buffington

INTRODUCTION

Figitid wasps (Hymenoptera) are a moderately speciose group of koinobiont endoparasitoids of endopterygote insect larvae. Adults typically range from 0.75 mm to 5.00 mm in body length. The primary hosts attacked by Figitidae are first- and second-instar larvae of cyclorrhaphous Diptera found in habitats ranging from leaf mines to decomposing plant and animal matter. The biology and diversity of this group on a global scale was reviewed in Ronquist (1999), Ronquist et al. (2006) and Buffington & Ronquist (2006).

The Figitidae is only lineage of the entire Cynipoidea known to occur in the United Arab Emirates (UAE). Absent are the gall inducing, phytophagous Cynipidae (though many species have been documented in southwestern Palearctic (Melika, 2006) and the middle East (Tavakoli et al., 2008; Karimpour et al., 2008), as well as the Liopteridae that occur throughout Africa (Benoit, 1955; Liu et al., 2007). The only common subfamily encountered within the UAE are the ubiquitous eucoilines; less commonly encountered are the Aspicerinae and Pycnostigmine. It is likely the hyper-parasitic Charipinae are also present in the country, but no specimens have been discovered. Among the eucoilines, most species can be determined using the comprehensive African studies by Quinlan (1986, 1988). Indeed, all the genera of Eucoilinae present in the UAE, save for one, are present in equatorial Africa. Further, the most common species are all known from equatorial Africa. The phylogeny presented in Buffington et al. (2007) suggested that the African lineages of Eucoilinae are the result of migration, followed by radiation, from southwestern Eurasia; the species reported in this work support this hypothesis. The UAE provides a sort of ‘crossroads’ for lineages, helping trace back the origins of currently distributed plant and animal groups.

To my knowledge, no thorough documentation of the figitid fauna has ever been undertaken for the Arabian Peninsula. To this end, presented here is a list of species based on fieldwork by Antonius van Harten, as well as a key and diagnoses for all genera of Figitidae in the UAE. The following new species are described from the UAE: *Tobiasiana theremini* and *Nordlanderia phaedrae*.

MATERIALS AND METHODS

The vast majority of specimens examined in this study were collected via light trap, Malaise trap or pan traps. These methods typically yield large numbers of cynipoids regardless of habitat. Unless otherwise stated, the specimens were collected by A. van Harten. Specimens were preserved in a minuscule amount of ethanol and shipped to the National Museum of Natural History, Smithsonian Institution (USNM). The specimens were dried from ethanol using a vacuum filtration system, developed by the author, then card or point mounted. Specimens from this study are deposited in the USNM, the United Arab Emirates Invertebrate Collection (UAEIC), and the University of California, Davis, Bohart Museum (UCD).

Scanning electron micrographs used herein were obtained from Morphbank (www.morphbank.net), and the images were obtained using methods summarized in Fontal-Cazalla et al. (2002) and Buffington (2009). Light microscope images were obtained using a Leica DRMB compound microscope with a GT-Vision Lw11057C-SCI digital camera, or a Leica M16 with a JVC KY-75U 3-CCD digital video camera attached. Both setups fed image

data to a desktop computer where the program Cartograph 5.6.0 merged an image series (representing typically 30 focal planes) into a single in-focus image. Lighting was achieved using techniques summarized in Kerr et al. (2009) and Buffington & Gates (2009).

Morphological terminology follows that of Ronquist & Nordlander (1989) and Fontal-Cazalla *et al.* (2002); cuticular surface terminology follows Harris (1979).

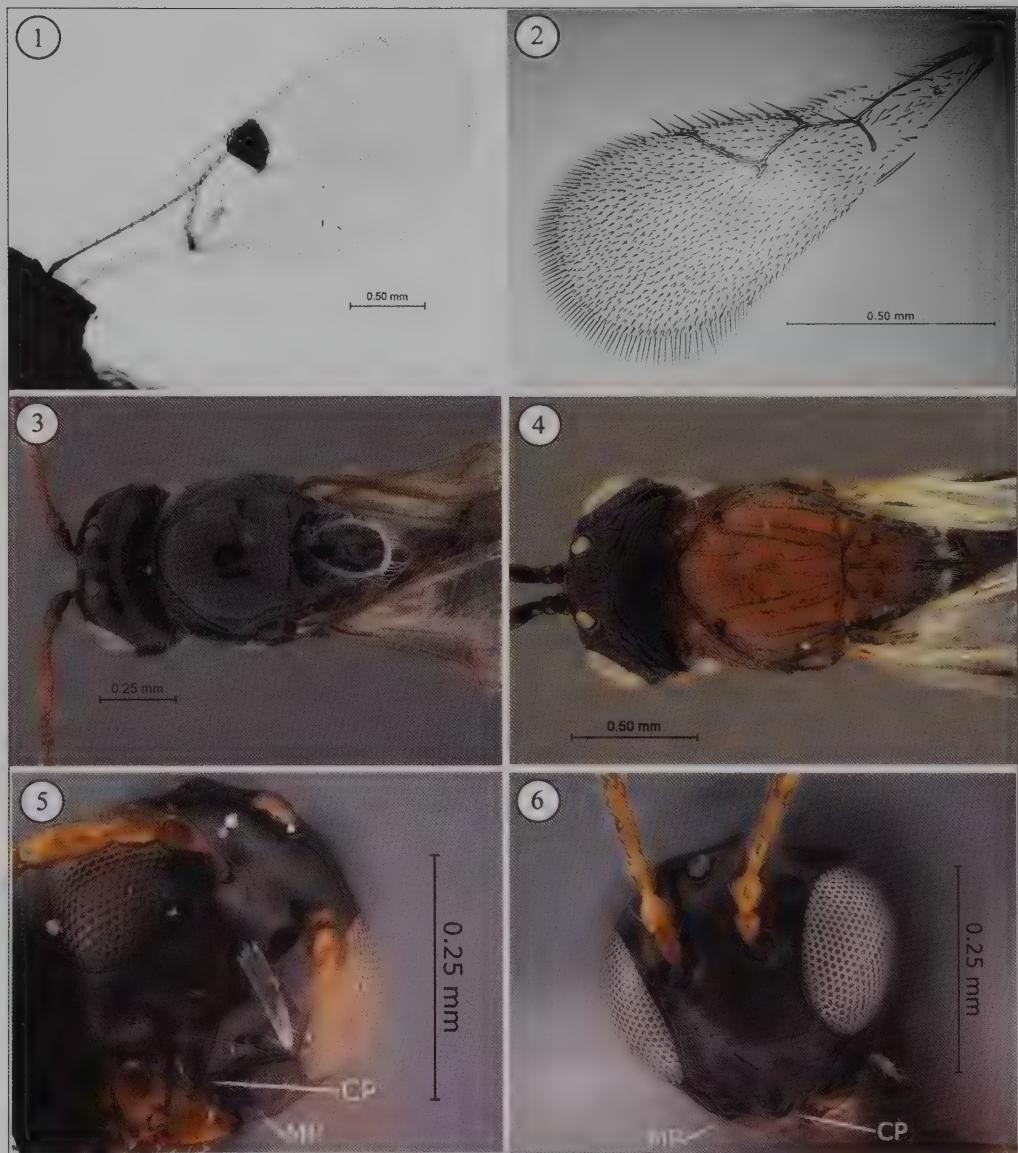
Abbreviations used: ML = Malaise trap; LT = light trap; WT = water trap; NARC = National Avian Research Centre.

SYSTEMATIC ACCOUNT

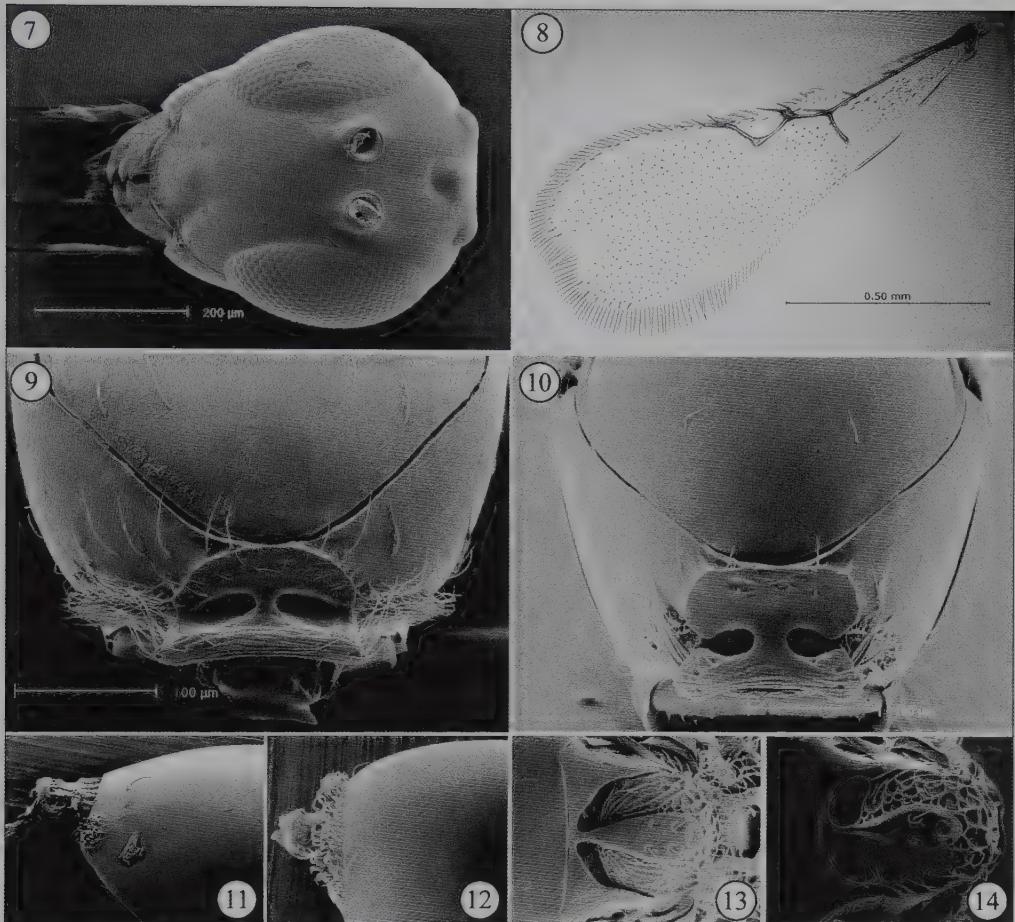
Key to the figitid genera of the UAE

Lighting is critical to the successful identification of Figitidae, especially the Eucoilinae. Care should be taken to use either light-dispersing film in conjunction with fibre optic illuminators or naturally light-dispersing fluorescent light sources. The key to genera is based females and males.

- 1 Forewing with a distinct pseudopterostigma, appearing as an extremely dark spot where the marginal cell of the forewing is located (Plate 1) *Pycnostigminae: Trjapitziniola* Kovalev
- Forewing lacking a pseudopterostigma, instead possessing a typical hyaline marginal cell (Plate 2) 2
- 2 Dorsal surface of scutellum lacking a plate, instead, surface rugulose (Plate 4); posterior margin of scutellum with a distinct spine (Plate 4) *Aspicerinae: Aspicera* Dahlbom
- Dorsal surface of scutellum with a distinct plate with the central pit (Fig 1C); posterior margin of scutellum rounded (Plate 3) Eucoilinae, 3
- 3 Anterior margin of clypeus and malar space with three distinct projections (Plates 5-6) 4
- Ventral margin of clypeus and malar space smooth and rounded, no projections present (Plate 7) 5
- 4 Projection off anterior margin of clypeus distinctly quadrate anteriorly, spade shaped (CP – Plate 5) *Tobiasiana* Kovalev
- Projection off anterior margin of clypeus conical, not spade shaped (CP - Plate 6)..... *Nordlanderia* Quinlan
- 5 Notauli present (Plate 3) *Gronotoma* Förster
- Notauli absent (Plates 9-10) 6
- 6 Lateral fovea of pronotal plate closed (Plate 9) *Rhopitromeris* Förster
- Lateral fovea of pronotal plate open (Plate 10) 7
- 7 Distal margin of forewing distinctly bilobed (Plate 8) *Kleidotoma* Westwood
- Distal margin of forewing rounded, not bilobed (Plate 2) 8
- 8 Anterior margin of metasoma completely lacking setae (Plate 11) ... *Cothonaspis* Hartig
- Anterior margin of metasoma with a ring of setae (Plate 12) 9
- 9 Ring of setae at base of metasoma incomplete, broken dorsally *Leptopilina* Förster
- Ring of setae at base of metasoma complete around the entire base (Plate 12) 10
- 10 Dorsal surface of scutellum distinctly striate anteriorly (Plate 13) *Hexacola* Förster
- Dorsal surface of scutellum rugulose over entire surface (Plate 14) *Ganaspis* Förster



Plates 1–6. Features of Cynipoidea in the UAE. 1: Forewing of the pycnostigmine *Tylosema rostratus* Cameron; 2: Forewing of the eucoiline *Ganaspis* spec.; 3: Dorsal view of the head and mesosoma of *Gronotoma lana* Quinlan; 4: Dorsal view of the head and mesosoma of *Aspicera* spec.; 5: Anterior view of head of *Tobiasiana theremini* nov. spec.; 6: Anterior view of head of *Nordlanderia phaedrae* nov. spec. MP = malar protuberance; CP = clypeal protuberance.



Plates 7–14. Features of Cynipoidea in the UAE. 7: Anterior view of head of *Ganaspis mundata* Hartig; 8: Forewing of *Kleidotoma favus* Quinlan; 9: Anterior view of the pronotum and mesoscutum of *Rhoptromeris heptoma* (Hartig); 10: Anterior view of the pronotum and mesoscutum of *Ganaspis mundata* Förster; 11: Anterior view of the metasoma of *Cothonaspis longula* Hartig; 12: Anterior view of the metasoma of *Hexacola* sp.; 13: Dorsal view of the scutellum of *Hexacola* sp.; 14: Dorsal view of the scutellum of *Ganaspis* sp.

Subfamily Aspicerinae Dalla Torre & Kieffer, 1910

Genus *Aspicera* Dahlbom, 1842

Species of *Aspicera* are the largest of cynipoids recorded from the UAE, frequently reaching over 3mm in length. One species is recorded from the UAE; the genus is presently being revised (Ros-Farre & Pujade Villar, pers. comm.), so no species determination is made at the present. Species of Aspicerinae are purported to be koinobiont endoparasitoids of Syrphidae (Ronquist, 1999; Buffington et al., 2007). The only other aspicerine recorded from the Arabian Peninsula is *Anacharoides striaticeps* Cameron, which has been recorded from Yemen (Buffington & van Noort, in press).

***Aspicera* spec.**

Plates 4, 15–16

Specimens examined: Near Mahafiz, SSW of ad-Dhaid, 1♀, 25.iii.2006, at light, leg. A. van Harten & K. Szpila; 1♀, 21–28.iii.2006, LT; 1♀, 4–11.iv.2006, LT. Sharjah Desert Park, 1♀, 29.iii–6.iv.2005, LT; 1♀, 6–30.iv.2005, LT; 4♀, 24.iii–1.iv.2007, LT; 1♀, 21.i–17.ii.2008, PT. Wadi Shawkah, 1♀, 20.iii.2007, with sweep-net, leg. F. Menzel & A. Stark. ISRAEL: Ma'agar Yerohom, 1♀, 4.iv.2007, leg. D. Gerling.

Distribution (of the genus): Holarctic region.

Subfamily **Eucoilinae** Thompson, 1862Genus ***Cothonaspis*** Hartig, 1840

Nordlander (1976) clarified the taxonomic history and morphology of this genus. The only hints to the biology of *Cothonaspis* species is a loose association with Sepsidae and cow manure reported by Nordlander (1976). I have swept and pan-trapped species of *Cothonaspis* in cow pastures in California. Two species of Sepsidae have been reported from the UAE (Stuke, 2008).

Quinlan's (1986) treatment of this genus in Africa is sound; the only species I was able to determine from the UAE was *Cothonaspis ealis* Quinlan.

Cothonaspis ealis Quinlan, 1986.

Plate 17

Specimens examined: Near ad-Dhaid, 1♀, 16–19.iii.2007, WT, leg. J. Batelka. Fujairah, 5♀, 28.ii–1.iv.2006, LT. Near Mahafiz, 1♀, 21–28.iii.2006, LT. Wadi Bih dam, 1♀, 6–17.iii.2008, LT. Wadi Safad, 2♀, 31.i–21.ii.2006, LT.

Distribution: Sub-Saharan Africa. New to the UAE.

Genus ***Ganaspis*** Förster, 1869

Ganaspis is one of the more problematic genera of Eucoilinae and is in desperate need of revision. As a consequence, I have hesitated to name the species from the UAE. Two distinct morphospecies were recorded, one of which looks much like *Ganaspis mundata* (Hartig). Neither species keys when using Quinlan (1986). Additionally problematic is how easily species of this genus are moved around the world by human activity. It is very likely that the two species I have examined are not endemic to the Arabian Peninsula. Species of *Ganaspis* have been reared from Drosophilidae (Nordlander, 1980, 1982; Vet & Bakker, 1985; Carton et al., 1986).

Ganaspis* cf. *mundata Förster, 1868

Plates 10, 18

Specimens examined: Fujairah, 3♂, 5♀, 28.ii–1.iv.2006, LT.

Distribution (of *G. mundata*): Cosmopolitan. New to the UAE.

***Ganaspis* spec.**

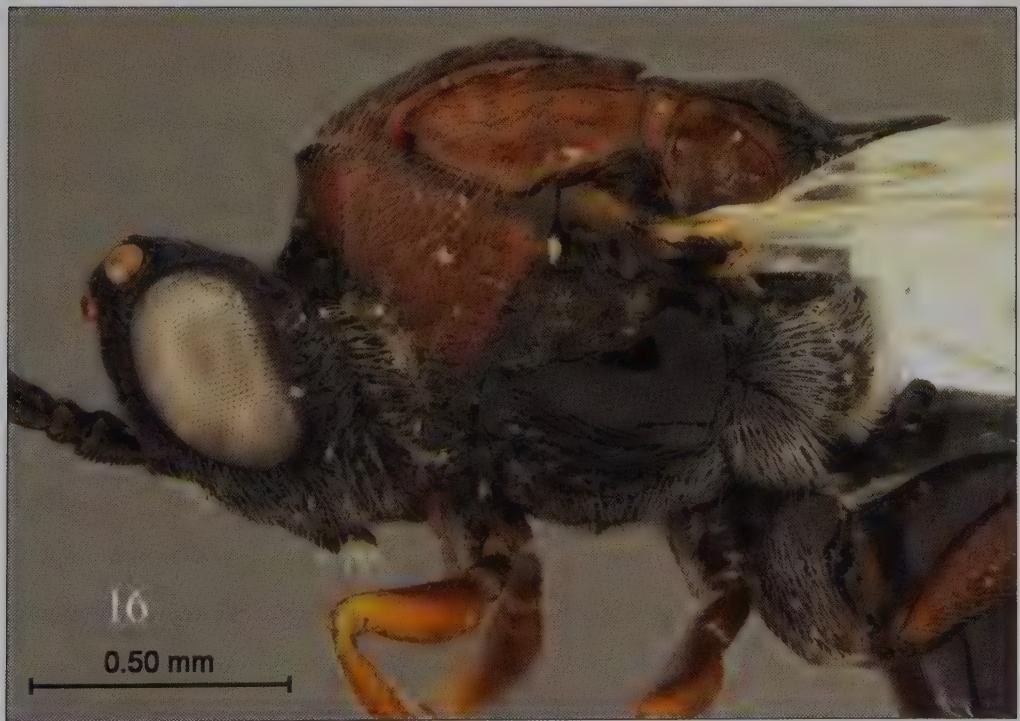
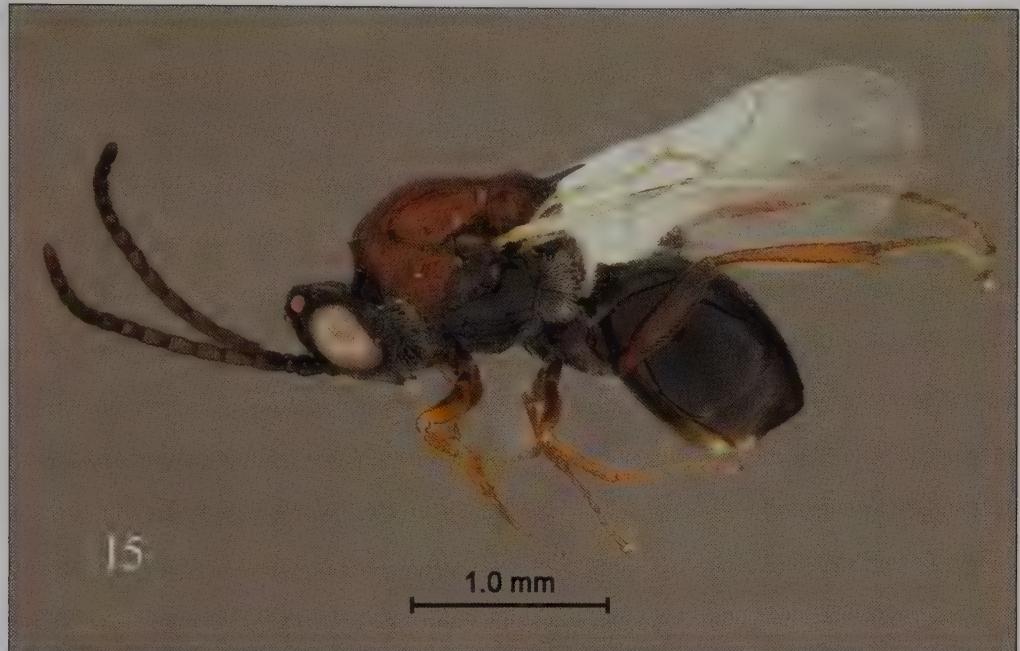
Plates 2, 14, 19

Specimens examined: Fujairah, 2♀, 1–8.iv.2006, LT; 1♀, 20–27.v.2006, LT. Sharjah, 1♀, 27.iv–5.vi.2005, LT. Sharjah Desert Park, 1♂, 17–24.iii.2007, LT. Wadi Bih dam, 1♀, 6–17.iii.2008, LT.

Distribution (of the genus): Cosmopolitan.

Genus ***Gronotoma*** Förster, 1869

Species of *Gronotoma* are very distinctive, with all possessing well-developed notaulices, relatively large scutellar plates (Fig. 1C), and lacking any setation around the anterior end of the metasoma. Species of *Gronotoma* are strictly parasitoids of Agromyzidae (Buffington 2002). Quinlan (1986) described several new species of *Gronotoma*, reflecting what appears



Plates 15–16. *Aspicera* spec. 15: Habitus, laterally; 16: Lateral view of head and mesosoma.



Plate 17. *Cothonaspis ealis* Quinlan, habitus, laterally.

to be a recent radiation of the group in Africa. One of these species, *G. nitida* Quinlan, is common throughout Africa, the Middle East, and Southeast Asia (Buffington, pers. obsv.). Two species are recorded from the UAE.

Gronotoma lana Quinlan, 1986

Plates 3, 20

Specimens examined: Sharjah-Khor Kalba, near tunnel, 1♂, 31.v–17.vi.2006, LT. Wadi Safad, 3♂, 26.xii.2005–2.i.2006, WT.

Distribution: Sub-Saharan Africa. New to the UAE.

Gronotoma marcellus Quinlan, 1986

Plate 21

Specimens examined: Sharjah Desert Park, 1♀, 29.iii–6.iv.2005, LT.

Distribution: Sub-Saharan Africa and Madagascar. New to the UAE.

Genus ***Hexacola*** Förster, 1869

As with *Ganaspis*, *Hexacola* is in need of revision. Species are also easily moved with human activity (Beardsley, 1989), and one species, *H. neoscatellae* Beardsley, 1989, can be an extremely beneficial natural enemy of shore flies (Ephydriidae) in greenhouses (Beardsley, 1989; Buffington, pers. obs.). The two species recorded from the UAE, *H. quisnama* Quinlan and *H. septemius* Quinlan, were both diagnosed entirely on antennal morphology. Nordlander (1976) demonstrated that antennal morphology can be quite misleading in eucoiline taxonomy, and hence, these species may ultimately be synonymized when the genus is revised.

18

A horizontal scale bar consisting of a short vertical line at each end connected by a horizontal line.

1.00 mm



19

A horizontal scale bar consisting of a short vertical line at each end connected by a horizontal line.

1.00 mm



Plates 18–19. 18: *Ganaspis* cf. *mundata* Förster, habitus, laterally; 19: *Ganaspis* spec., habitus, laterally.



20

1.00 mm



21

1.00 mm

Plates 20–21. *Gronotoma lana* Quinlan, habitus, laterally; 21: *Gronotoma marcellus* Quinlan, habitus, laterally.

Hexacola quismana Quinlan, 1986

Plate 22

Specimens examined: Sharjah Desert Park, 3♀, 29.iii–6.iv.2005, LT.

Distribution: Sub-Saharan Africa. New to the UAE.

Hexacola septemius Quinlan, 1986

Plate 23

Specimens examined: Al-Ajban, 5♀, 9.xi–7.xii.2005, MT & LT; 4♂, 39♀, 25.iii–2.iv.2006, MT; 1♀, 17–24.iv.2006, MT; 1♀, 27.xii.2006–18.ii.2007, MT. Fujairah, 1♂, 4♀, 6.iv–2.v.2005, LT; 2♀, 2–30.i.2006, LT; 1♀, 28.ii–1.iv.2006, LT. Hatta, 1♂, 1♀, 19–28.iii.2006, LT; 3♂, 15♀, 4–11.iv.2006, LT; 3♂, 2♀, 22–29.i.2007, LT. Khor al-Khwair, 1♀, 1–8.iii.2007, LT; 1♀, 7–14.iv.2007, LT. Near Mahafiz, 2♀, 21–28.iii.2006, LT; 1♀, 4–11.iv.2006, LT; 2♀, 19–26.iv.2006, LT; 7♂, 8♀, 21–28.viii.2006, LT. Sharjah, 1♀, 27.iv–5.vi.2005, LT. Sharjah Desert Park, 2♀, 21–29.iii.2005, LT; 8♀, 29.iii–6.iv.2005, LT; 2♀, 6–30.iv.2005, LT; 1♀, 31.v–30.vi.2005, LT; 2♀, 17–24.iii.2007, LT; 1♂, 5♀, 24.iii–1.iv.2007, LT; 1♀, 22–30.iv.2007, LT; 2♀, 22.v–4.vi.2007, LT; 1♂, 1♀, 20.x–24.xi.2007, LT; 1♂, 12♀, 14.ii–1.iv.2008, LT; 7♀, 1–6.vi.2008, LT. Sharjah-Khor Kalba, near tunnel, 1f, 7–14.VI.2006, LT. NARC, near Sweihan, 2f, 14.iii–3.iv.2005, LT; 1♂, 2♀, 2–30.iv.2005, LT. Wadi Bih dam, 5♀, 15–22.iii.2007, LT; 1♂, 1♀, 24.iv–1.v.2007, LT; 1♀, 22.x–15.xi.2007, LT. Wadi Safad, 1♂, 1♀, 28.iii.2007, with sweep-net, leg. F. Menzel. Wadi Shawkah, 1♀, 20.iii.2007, with sweep-net, leg. F. Menzel & A. Stark; 1♀, 5–12.v.2007, WT; 1♀, 30.vi–2.viii.2007, WT.

Distribution: Sub-Saharan Africa. New to the UAE.

Genus ***Kleidotoma*** Westwood, 1833

Species of *Kleidotoma* are united by several derived features, most notably, a bilobed distal margin of the forewing (Plate 8). The only other cynipoid taxa that share this feature are the emarginine figitids. Two species are recorded from the UAE, and both are species that have been described from Africa. As in the case of *Hexacola*, these species belong to a large genus that is in need of revision. Further, these species are based entirely on antennal morphology. They may prove to be synonyms following a generic revision of *Kleidotoma*. Species of *Kleidotoma* have been associated with cow dung and carrion (Buffington, pers. obs.) and algal mats (Beardsley, 1993).

Kleidotoma favus Quinlan, 1986.

Plates 8, 24

Specimens examined: N of Ajman, 1♀, 9–23.xii.2006, WT. Fujairah, 2♀, 13.xi–10.xii.2005, LT; 3♀, 10.xii.2005–2.i.2006, LT. Hatta, 2♀, 22–29.i.2006, LT; 3♀, 19–28.iii.2006, LT. Sharjah Desert Park, 1♀, 6–30.iv.2005, LT. Wadi Bih dam, 1♀, 6–17.iii.2008, LT. Wadi Safad, 7♀, 31.i–21.ii.2006, LT. Wadi Shawkah, 1♀, 28.x–15.xi.2007, WT.

Distribution: Sub-Saharan Africa. New to the UAE.

Kleidotoma cf. erebus Quinlan, 1986

Plate 25

Specimens examined: Al-Ajban, 1♀, 17–24.iv.2006, MT. Sharjah Desert Park, 2♀, 29.iii–6.iv.2005, LT.

Distribution: Sub-Saharan Africa. New to the UAE.

Genus ***Leptopilina*** Förster, 1869

Nordlander (1980) revised the European species of *Leptopilina* and Quinlan (1988) revised the Afrotropical species and described nine new species. This genus is distinct in that the setose ring at the base of the metasoma is dorsally interrupted, such that there are only setae on the lateral aspects of the metasoma. Two species are recorded from the UAE. Species of *Leptopilina* are parasitoids of Drosophilidae (Nordlander, 1980).

Leptopilina boulardi (Barbotin, Carton & Kelner-Pillault, 1979)

Plate 26

Specimens examined: Al-Ajban, 1♀, 9.xi–7.xii.2005, MT & LT; 5♀, 25.iii–2.iv.2006, MT.

Distribution: Holarctic, probably worldwide. New to the UAE.



22

1.00 mm



23

1.00 mm

Plates 22–23. 22: *Hexacola quismana* Quinlan, habitus, laterally; 23: *Hexacola septemius* Quinlan, habitus, laterally.

24

1.00 mm



25

1.00 mm



Plates 24–25. 24: *Kleidotoma favus* Quinlan, habitus, laterally; 25: *Kleidotoma* cf. *erebus* Quinlan, habitus, laterally.

Leptopilina victoriae Nordlander, 1980.

Plate 27

Specimens examined: Al-Ajban, 1♀, 9.xi–7.xii.2005, MT & LT; 2♀, 25.iii–2.iv.2006, MT. Sharjah Desert Park, 1♂, 21–29.iii.2005, LT.

Distribution: Sub-Saharan Africa; based on host records (Nordlander, 1980), likely in the Oriental and Neotropical regions as well. New to the UAE.

Genus *Nordlanderia* Quinlan, 1986

Species in this genus are closely related to *Gronotoma* and are known to parasitize Agromyzidae (Buffington & LaSalle, unpublished data). As in the case of *Gronotoma nitida*, *Nordlanderia plowa* Quinlan can be found throughout India and Southeast Asia (Buffington, pers. obs.). There are undoubtedly several undescribed species in this genus. Three species are recorded from the UAE, one described as new to science. Based on the specimens sent for the present research, *Nordlanderia plowa* is one of the most frequently encountered species of Figitidae in the UAE.

Kovalev & Runeva (2004) considered *Nordlanderia* a junior synonym of *Tobiasiana*, recognizing *Nordlanderia* as a subgenus of *Tobiasiana*. The justification for this move is unclear, and until further phylogenetic data can be obtained, I prefer *Nordlanderia* to remain a valid genus. Species of these two genera can be recognized based on the clypear and metapleural morphology. The following species of *Nordlanderia* are hereby removed from synonymy with *Tobiasiana*: *Nordlanderia acis* Quinlan, 1986, **revised status**; *N. pallida* Quinlan, 1986, **revised status**; *N. plowa* Quinlan, 1986, **revised status**. Two additional species, *Tobiasiana merickeli* (Miller, 1989) and *T. navajoe* (Miller, 1989), were considered *nomina dubia* by Buffington (2004) since the holotypes for both species have been lost; hence, both species are removed from synonymy with *Tobiasiana* and returned to *Nordlanderia*: *N. merickeli* Miller, 1989, **revised status**; *N. navajoe* Miller, 1989, **revised status**.

Nordlanderia plowa Quinlan, 1986

Plate 28

Specimens examined: Al-Ajban, 2♂, 1♀, 26.iii–8.iv.2006, MT. Near ad-Dhaid, 74♂, 4♀, 16–19.iii.2007, WT, leg. J. Batelka. Fujairah, 1♀, 6.iv–2.v.2005, LT; 1♂, 2♀, 28.ii–1.iv.2006, LT; 2♀, 20–27.v.2006, LT. Khor al-Khwair, 1♂, 1♀, 15–22.iii.2007, LT. Sharjah Desert Park, 1♀, 29.iii–6.iv.2005, LT; 2♂, 6–30.iv.2005, LT. Sharjah-Khor Kalba, near tunnel, 1♀, 31.v–17.vi.2006, LT; 1♀, 7–14.vi.2006, LT. Wadi Bih dam, 1♂, 2♀, 29.iii.2007, with sweep-net, leg. F. Menzel; 1♂, 1♀, 1–6.iii.2008, LT. Wadi Maidaq, 4♀, 29.iii–10.iv.2006, WT; 1♀, 24.ix–22.x.2006, WT. Wadi Shawkah, 1♂, 1♀, 20.iii.2007, with sweep-net, leg. F. Menzel; 1♀, 28.x–15.xi.2007, WT. Wadi Wurayah, 1♂, 3♀, 12–14.iv.2005, MT & WT, leg. T. Pape.

Distribution: Sub-Saharan Africa. New to the UAE.

Nordlanderia pallida Quinlan, 1986

Plate 29

Specimens examined: Near ad-Dhaid, 1♀, 16–19.iii.2007, WT, leg. J. Batelka. Sharjah, 1♀, 27.iv–5.vi.2005, LT. Sharjah Desert Park, 1♀, 4–8.xii.2004, WT; 4♂, 16♀, 29.iii–6.iv.2005, LT; 1♂, 6–30.iv.2005, LT; 1♀, 31.v–30.vi.2005, LT; 2♀, 8.xi–20.xii.2005, LT; 1♂, 17–24.iii.2007, LT. NARC, near Sweihan, 2♀, 2–30.iv.2005, LT. Wadi Maidaq, 3♀, 26.xii.2005–2.i.2006, WT; 2♂, 1♀, 4–25.i.2006, WT; 3♀, 7–14.iii.2006, WT; 1♀, 29.iii–10.iv.2006, WT. Wadi Safad, 1♀, 31.i–21.ii.2006, LT. Wadi Siji, 2♀, 24.ix–22.x.2006, WT. Wadi Wurayah, 1♂, 3♀, 12–14.iv.2005, MT & WT, leg. T. Pape; 1♀, 18–25.iii.2007, MT.

Distribution: Sub-Saharan Africa (Quinlan, 1986) and Oriental Region (Buffington, pers. obs.). New to the UAE.



26

1.00 mm



27

Plates 26–27. 26: *Leptopilina boulardi* (Barbotin, Carton & Kelner-Pillault), habitus, laterally; 27: *Leptopilina victoriae* Nordlander, habitus, laterally.



28

1.00 mm



29

1.00 mm

Plates 28–29. 28: *Nordlanderia plowa* Quinlan, habitus, laterally; 29: *Nordlanderia pallida* Quinlan, habitus, laterally.

***Nordlanderia phaedrae* Buffington nov. spec.**

Plates 6, 30–31

Specimens examined. Holotype: ♀, UNITED ARAB EMIRATES, near ad-Dhaid, 25°22'N, 55°59'E, 16–19.iii.2007, in water trap, leg. J. Batelka (USNM). Paratypes: 1♀, Hatta, 24–30.v.2006, LT. 2♀, Wadi Maidaq, 29.iii–10.iv.2006, WT; 1♀, 24.ix–22.x.2006, WT. 1♂, 2♀, Wadi Wurayah, 12–14.iv.2005, MT & WT, leg. T. Pape.

Diagnosis: Differs from all other species of *Nordlanderia* by the distinctly enlarged scutellar plate. In dorsal view, nearly the entire (90%) dorsal surface of the scutellum is obscured by the rim of the scutellar plate in *N. phaedrae*; in other species of *Nordlanderia*, a smaller percentage (<50%) of the dorsal surface of the scutellum is obscured.

Description: Adult length: 0.88–1.22 mm (n=8). Head and mesosoma black; metasoma dark brownish-black; legs pale brown medially, blending to yellow distally.

Head. Nearly glabrous with scattered setae along lower face, inner orbits of compound eyes, clypeus and gena; ocellar hair patch absent. Ventral 1/4 of lower face with admedial clypeal furrows converging towards the clypeus; convergence point extending to distinct conical protuberance. Orbital furrows absent. Malar sulcus simple. Malar space weakly strigose, glabrous; ventral margin with distinct conical protuberance. Genal carina absent. Antennae. Female: 13 segments, moniliform, semi-clavate; flagellomeres 1–10 sub-equal in length; subapical flagellomere equal to 1.4× the length of apical flagellomere; rhinaria present on flagellomeres 3–11. Male: 15 segments, moniliform; rhinaria present on flagellomeres 1–13; flagellomeres 2–13 sub-equal in length. flagellomere 1 modified, 1.5× longer than flagellomere 2, curved outwardly, excavated laterally.

Pronotum. Pronotal plate narrow; dorsal margin with a few scattered setae; dorsal margin rounded; pronotal lateral fovea open. Lateral pronotal carina present. Lateral portion of pronotum (posterior to lateral carina) smooth and glabrous. Pronotal impression absent. Mesoscutum. Smooth and nearly glabrous, with only a few scattered setae. Notaulus reduced, marked with setae, converging weakly towards each other near the posterior margin of mesoscutum. Parascutal impression complete. Medial mesoscutal keel, parapsidal ridges absent. Mesoplectus. Upper and lower part of mesopleuron smooth and glabrous. Dorsal and ventral margins of mesopleural triangle distinct (at least posteriorly). Mesopleural carina simple. Lower part of mesopleuron bordered by a prominent precoxal carina; surcoxal depression prominent, rugose. Scutellum. Scutellar plate small; midpit placed towards posterior of plate; rim of plate translucent; tubercles absent along dorsal surface of plate.

Dorsal surface of scutellum not obscured by rim of scutellar plate; scutellum smooth, glabrous; rounded laterally and posteriorly; margined laterally and posteriorly; laterodorsal and posterior projections of the scutellum absent. Lateral bars as long as wide; ventral lobe absent. Scutellar fovea semi-circular, smooth and deep. Metapectal-propodeal complex. Entire metapectus glabrous, posterior 1/3 with some scattered setae. Spiracular groove with a well-defined dorsal margin, ventral margin reduced. Posterior margin of metapectus ridged. Metapleural ridge reduced to absent; submetapleural ridge absent. Anterior impressions of metepimeron and metepisternum reduced. Propodeum with few, scattered, slender setae, revealing all propodeal sculpturing. Lateral propodeal carinae parallel, slightly bowed at fusion point with auxiliary propodeal carinae; auxiliary propodeal carinae reduced; area between lateral propodeal carinae bare. Nucha glabrous, rugose. Wings. Hyaline; setose. R1 complete, pigmented along anterior margin; marginal cell slightly longer than deep. Apical fringe present, short. Legs. Fore and mid coxa sub-equal in size, hind coxa about twice the size of either fore or mid coxa. Fore coxa variously setose; mid and hind coxa with lateral and posterior dorsoventral setal band. Femora and tibia variously setose, sometimes rather sparsely; tarsomeres with dense appressed setae. Length of hind tarsomere 1 equal to 0.50× to 0.75× the combined length of remaining tarsomeres.



Plates 30–31. *Nordlanderia phaedrae* Buffington nov. spec. 30: Habitus, laterally; 31: Lateral view of head and mesosoma.

Metasoma. Female: Sub equal in size to mesosoma. Crenulate ring present, usually obscured by syntergum; when visible, with prominent lateral carinae and glabrous. Base of syntergum nearly glabrous, with a few scattered hairs ventrally; remainder of metasoma glabrous. Micropunctures present on posterior 1/3 of syntergum and on remaining terga. Terga posterior to syntergum directed ventrally, resulting in a 90 degree angle between syntergum and remaining terga. Male: As in the female.

Biology: Unknown

Etymology: Named in honour of the elusive woman ‘Phaedra’, a character in Nancy Sinatra and Lee Hazelwood’s 1967 recording of ‘Some Velvet Morning’ (Reprise Records).

Genus *Rhoptromeris* Förster, 1869

This genus was revised by Nordlander (1978); Quinlan (1986) described 30 new species from the Afrotropical region. *Rhoptromeris* superficially resembles *Leptopilina*, but it is readily distinguished from that genus by the uniquely ‘closed’ lateral fovea of the pronotal plate (Plate 9). Only one species is recorded from the UAE. Species of *Rhoptromeris* have been reported to be parasitoids of Chloropidae (Nordlander, 1978).

Rhoptromeris persius Quinlan, 1986

Plate 32

Specimens examined: Al-Ajban, 1♀, 17–24.iv.2006, MT; 1♀, 27.xii.2006–18.ii.2007, MT. Khor al-Khwair, 2♀, 15–22.iii.2007, LT. Near Mahafiz, 1♀, 21–28.iii.2006, LT. Sharjah Desert Park, 1♀, 29.iii–6.iv.2005, LT; 2♀, 6–30.iv.2005, LT; 1♀, 21.i–17.ii.2008, in pitfall trap; 1♀, 1–6.iv.2008, LT. NARC, near Sweihan, 4♀, 2–30.iv.2005, LT.

Distribution: Sub-Saharan Africa. New to the UAE.

Genus *Tobiasiana* Kovalev, 1979

This rather unusual genus was described to accommodate *Tobiasiana arida* Kovalev, 1979, described from the southwestern regions of the former Soviet Union. This genus is putatively closely related to *Nordlanderia* and *Microstilba* Förster, 1869, in that the notauli are present but greatly reduced, and the anterior margins of both the clypeus and malar space are armed with distinct protuberances. *Tobiasiana* is distinguished from these genera by the clypeal protuberance being spade shaped, as in a shovel. Further, the genus can be further separated from *Nordlanderia* by the reduced spiracular groove on the metapleuron (distinct in *Nordlanderia*). One species, new to science, is here recorded from the UAE and Israel.

Tobiasiana theremini Buffington nov. spec.

Plates 5, 33–34

Specimens examined: Holotype: ♂, UNITED ARAB EMIRATES, al-Ajban, 24°36'N 55°01'E, 27.v–26.vi.2006, in light trap, leg. A. van Harten (USNM). Paratypes: 1♂, Sharjah Desert Park, 30.iv–25.v.2008, LT; 2♂, 25.v–30.vi.2008, LT. ISRAEL: Arava Valley, 2km N Hazeva School, 30°47'N 35°15'E, 140 m, 1♀, 28–30.iv.1996, leg. M.E. Irwin (UCD).

Diagnosis: Readily distinguished from *Tobiasiana arida* by having a distinctly smooth dorsal surface of the scutellum (*T. arida* has a rugulose dorsal surface of the scutellum).

Description: Adult length 1.25 mm (n=2). Head and mesosoma dark brown; metasoma reddish-brown; legs pale brown medially, blending to yellow distally.

Head. Nearly glabrous with scattered setae along lower face, inner orbits of compound eyes, clypeus, and gena; ocellar hair patch absent. Ventral 1/4 of lower face with admedial clypeal furrows converging towards the clypeus; convergence point extending to distinct spade-shaped protuberance. Orbital furrows absent. Malar sulcus simple. Malar space smooth, glabrous; ventral margin with distinct conical protuberance. Genal carina absent. Antennae. Female: 13 segments, moniliform, semi clavate; flagellomeres 1–10 sub equal in length;



Plate 32: *Rhoptromeris persius* Quinlan, habitus, laterally.

subapical flagellomere equal to $1.4 \times$ the length of apical flagellomere; rhinaria present on flagellomeres 3–11. Male: 15 segments, moniliform; rhinaria present on flagellomeres 1–13; flagellomeres 2–13 sub equal in length. Flagellomere 1 modified, slightly longer than flagellomere 2, curved outwardly, excavated laterally.

Pronotum. Pronotal plate narrow; dorsal margin with a few scattered setae; dorsal margin rounded; pronotal fovea open. Lateral pronotal carina present, at least ventrally. Lateral portion of pronotum (posterior to lateral carina) smooth and glabrous. Pronotal impression absent. Mesoscutum. Smooth and glabrous, with a few scattered setae. Notaulus reduced, marked with setae, converging sharply towards each other near the posterior margin of mesoscutum. Parascutal impression complete. Mesoscutal keel, parapsidal signum absent. Mesopectus. Upper and lower part of mesopleuron smooth and glabrous. Dorsal and ventral margins of mesopleural triangle distinct (at least posteriorly). Mesopleural carina simple. Lower part of mesopleuron bordered by a prominent precoxal carina; surcoxal depression prominent, rugose. Scutellum. Scutellar plate large; midpit placed in center of plate; rim of plate translucent; tubercles present along dorsal surface of plate. Dorsal surface of scutellum obscured by rim of scutellar plate; scutellum rugose; rounded laterally and posteriorly; margined laterally and posteriorly; laterodorsal and posterior projections of the scutellum absent. Lateral bars as long as wide; ventral lobe absent. Scutellar fovea semi circular, smooth and deep. Metapectal-propodeal complex. Anterior 2/3 of metapectus glabrous, posterior 1/3 glabrous to setose; setae, when present, long but not dense. Spiracular groove with a well-defined dorsal margin, ventral margin reduced. Posterior margin of metapectus ridged.



Plates 33-34. *Tobiasiana theremini* Buffington nov. spec. 33: Habitus, laterally; 34: Lateral view of head and mesosoma.

Metapleural ridge reduced to absent, often lined with setae; submetapleural ridge absent. Anterior impressions of metepimeron and metepisternum reduced. Propodeum covered with thin, long setae revealing much of the propodeal sculpturing. Lateral propodeal carinae semi parallel, bowed at fusion point with auxiliary propodeal carinae; auxiliary propodeal carinae distinct; area between lateral propodeal carinae bare. Nucha glabrous, rugose. Wings. Hyaline; setose. R1 complete, pigmented along anterior margin; marginal cell slightly longer than deep. Apical fringe present, short. Legs. Fore and mid coxa sub equal in size, hind coxa about twice the size of either fore or mid coxa. Fore coxa variously setose; mid and hind coxa with lateral and posterior dorsoventral setal band. Femora and tibia variously setose, sometimes rather sparsely; tarsomeres with dense appressed setae. Length of hind tarsomere 1 equal to $0.50 \times$ to $0.75 \times$ the combined length of remaining tarsomeres.

Metasoma. Female: Sub equal in size to mesosoma. Crenulate ring present, usually obscured by syntergum; when visible, glabrous with prominent lateral carinae. Base of syntergum nearly glabrous, with only a few scattered hairs ventrally; remainder of metasoma glabrous. Micropunctures present on posterior 1/3 of syntergum and on remaining terga. Terga posterior to syntergum directed ventrally, resulting in a 90 degree angle between syntergum and remaining terga. Male: as in the female.

Biology: Unknown.

Etymology: Named in honour of the Russian physicist and audio engineer Leon Theremin. His research in the 1920s led to the first truly electronic musical instrument known as the *theremin*. The instrument was played by interrupting electromagnetic fields produced between two antennas (Glinksy, 2000).

Subfamily **Pycnostigminae** Cameron, 1905

Genus ***Trjapitziniola*** Kovalev, 1995

All species of pycnostigmines are united by the possession of a pseudopterostigma in the forewing (Ronquist, 1999; Buffington & van Noort, 2007) (Plate 1). This striking group of wasps has their centre of species diversity in the Western Cape Region of South Africa, though three species can be found north of the Saharan Desert: *Tylosema nigerrimum* Kieffer, 1905 (from Algeria: Buffington & van Noort, 2007, and Jordan: M. Forshage, pers. comm.), and two species of *Trjapitziniola*: *T. popovi* (Belezin, 1951) from Armenia and *T. vanharteni* from the UAE (Buffington & van Noort, 2007). The biology of pycnostigmines is unknown.

Trjapitziniola vanharteni Buffington & van Noort, 2007

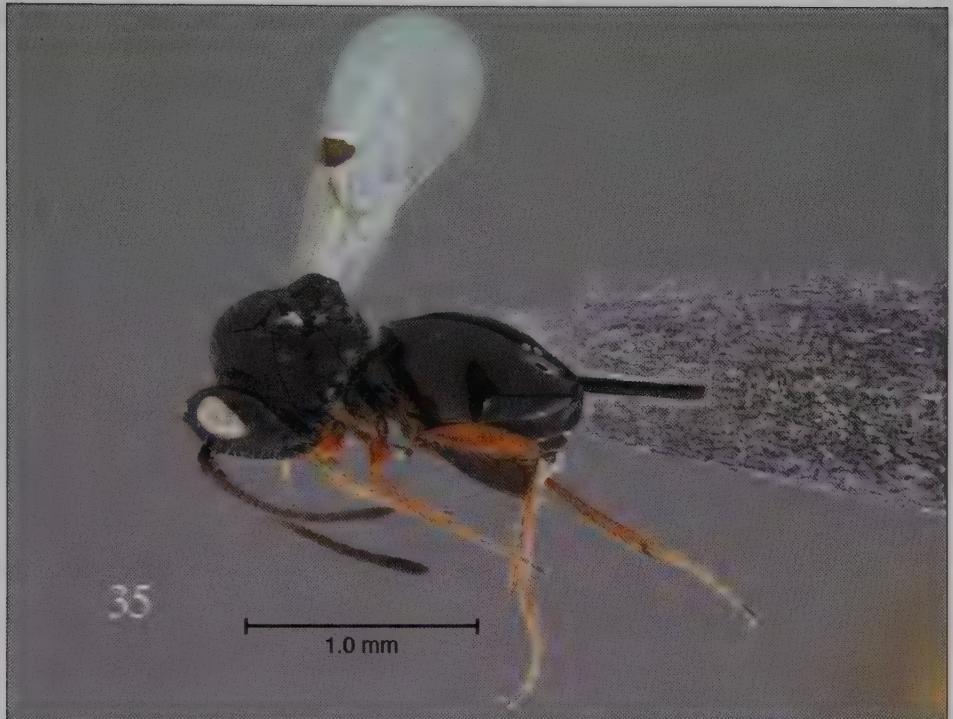
Plates 35–36

Specimens examined: Wadi Maidaq, 1♀ (holotype), 29.iii–10.iv.2006, WT.

Distribution: Currently only known from the UAE. Likely occurs near the coast of the Arabian Peninsula, and into southeastern Turkey.

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Plates 35-36. *Trjapitziniola vanharteni* Buffington & van Noort. 35: Habitus, laterally; 36: Lateral view of head and mesosoma.

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Order Hymenoptera, family Braconidae

Genus *Microtypus* Ratzeburg (Hymenoptera: Braconidae: Microtypinae)

Cornelis van Achterberg

INTRODUCTION

Tony van Harten collected the largest known series of a species of *Microtypus* Ratzeburg (Hymenoptera: Braconidae: Microtypinae) in the deserts of the United Arab Emirates, which turned out to belong to a new species (Fig. 1) close to the South Palaearctic *M. desertorum* Shestakov. This is the third known species (besides *M. algiricus* Szépligeti, and *M. desertorum* Shestakov) of the genus *Microtypus* belonging to the group of nocturnal species restricted to the South Palaearctic region.

Microtypus is a small Holarctic genus, with a species in the intermediate (Afrotropical/Palaearctic) region of the Arabian Peninsula. They are koinobiont endoparasitoids of larvae of Lepidoptera (Pyralidae, Tortricidae and Gelechiidae; Čapek & van Achterberg, 1992).

MATERIALS AND METHODS

The specimens are mostly deposited in the United Arab Emirates Invertebrate Collection and in the collection of the Nationaal Natuurhistorisch Museum (Naturalis), Leiden. All specimens have been collected by A. van Harten.

Abbreviations used: RMNH = Nationaal Natuurhistorisch Museum (Naturalis), Leiden; UAE = United Arab Emirates; OOL = ocellar ocular line; POL = posterior ocular line; LT = light trap; MT = Malaise trap; WT = water traps; NARC = National Avian Research Centre.

For the terminology used in this paper, see van Achterberg (1988, 1993), for identification of the subfamily Microtypinae, see van Achterberg (1993, 1997) and for the existing literature, see Yu et al. (2008).

SYSTEMATIC ACCOUNT

Key to species of the genus *Microtypus* Ratzeburg

- 1 Length of malar space 0.1–0.3 times basal width of mandible (Fig. 6), malar space narrow in anterior view (Figs 4, 8, 13); length of ovipositor sheath 0.4–0.6 times fore wing; pterostigma and frons (nearly) completely yellowish; antennal segments 39–52; area between posterior ocellus and eye 0.4–1.6 times as wide as posterior ocellus (Figs 3, 9, 14); South Palaearctic, including Arabian Peninsula 2
- Length of malar space 0.4–0.6 times basal width of mandible (Fig. 16), malar space distinctly visible in anterior view (Fig. 18); length of ovipositor sheath 0.6–0.8 times fore wing; pterostigma dark brown, pale brownish or brownish-yellow; middle part of frons often black or blackish; antennal segments 34–43; area between posterior ocellus and eye 1.1–1.6 times as wide as posterior ocellus (Fig. 19); North & Central Palaearctic, Nearctic 4
- 2 Length of ovipositor sheath about 0.4 times fore wing; length of malar space 0.1 times basal width of mandible (Fig. 8); length of eye in dorsal view about 2.4 times temple and roundly narrowed behind eyes (Fig. 9); triangular area above clypeus flat; anterior half

- of side of pronotum with coarse striae; scapus and pedicellus completely yellowish and contrasting with dark brown third and following antennal segments; antennal segments 49–52; length of fore wing 6.5–7 mm *M. algirus* Szépligeti, 1908
- Length of ovipositor sheath 0.5–0.6 times fore wing; length of malar space 0.2–0.3 times basal width of mandible (Figs 4, 13); length of eye in dorsal view 3.2–3.4 times temple and more directly narrowed behind eyes (Figs 3, 14); triangular area above clypeus weakly convex; anterior half of side of pronotum without striae; scapus and pedicellus similarly yellowish as third and following antennal segments or slightly paler; antennal segments 34–42; length of fore wing 2.5–5.5 mm 3
- 3 ♂ Length of inner hind tibial spur of female 0.5 times as long as hind basitarsus (Fig. 12); length of hind basitarsus 11–12 times its apical width (Fig. 12); POL of female 1.0–1.5 times diameter of posterior ocellus (Fig. 14); anterior ocellus comparatively far from posterior ocelli (Fig. 14); first metasomal tergite smooth or nearly so; Central Asia *M. desertorum* Shestakov, 1932
- Length of inner hind tibial spur of female 0.4 times as long as hind basitarsus (Fig. 2); length of hind basitarsus 12–15 times its apical width (Fig. 2); POL of female 0.7–0.9 times diameter of posterior ocellus (Fig. 3; of males often slightly longer); anterior ocellus close to posterior ocelli (Fig. 3); first tergite usually at least superficially rugose (Fig. 5); North Africa, Arabian Peninsula *M. vanharteni* nov. spec.
- 4 Length of ovipositor sheath 0.7–0.8 times fore wing, and about 1.5 times length of metasoma; occipital flange distinctly protruding in lateral view (Fig. 34); length of fore wing (3.0–)4.0–5.5 mm; parasitoids of Pyralidae, exceptionally of Tortricidae; Holarctic *M. wesmaelii* Ratzeburg, 1848
- Length of ovipositor sheath 0.4–0.6 times fore wing, and about as long as length of metasoma; occipital flange hardly or not protruding in lateral view (Fig. 32); length of fore wing 3.5–4.5 mm; parasitoids of Gelechiidae and Tortricidae (unknown for *M. petiolatus*); North & Central Palaearctic 5
- 5 Pterostigma and frons completely brownish-yellow; length of first tergite 1.3–1.6 times its apical width (Fig. 17); second submarginal cell of fore wing distinctly petiolate; antennal segments 39–40; ocelli medium-sized (Fig. 19) *M. petiolatus* van Achterberg, 1992
- Pterostigma dark brown; frons (largely) black; length of first tergite 1.7–1.8 times its apical width (Fig. 15); second submarginal cell of fore wing usually sessile; antennal segments 34–36; ocelli slightly smaller *M. trigonus* (Nees, 1834)

Genus *Microtypus* Ratzeburg, 1848

Microtypus vanharteni van Achterberg nov. spec.

Plate 1, Figures 1–19

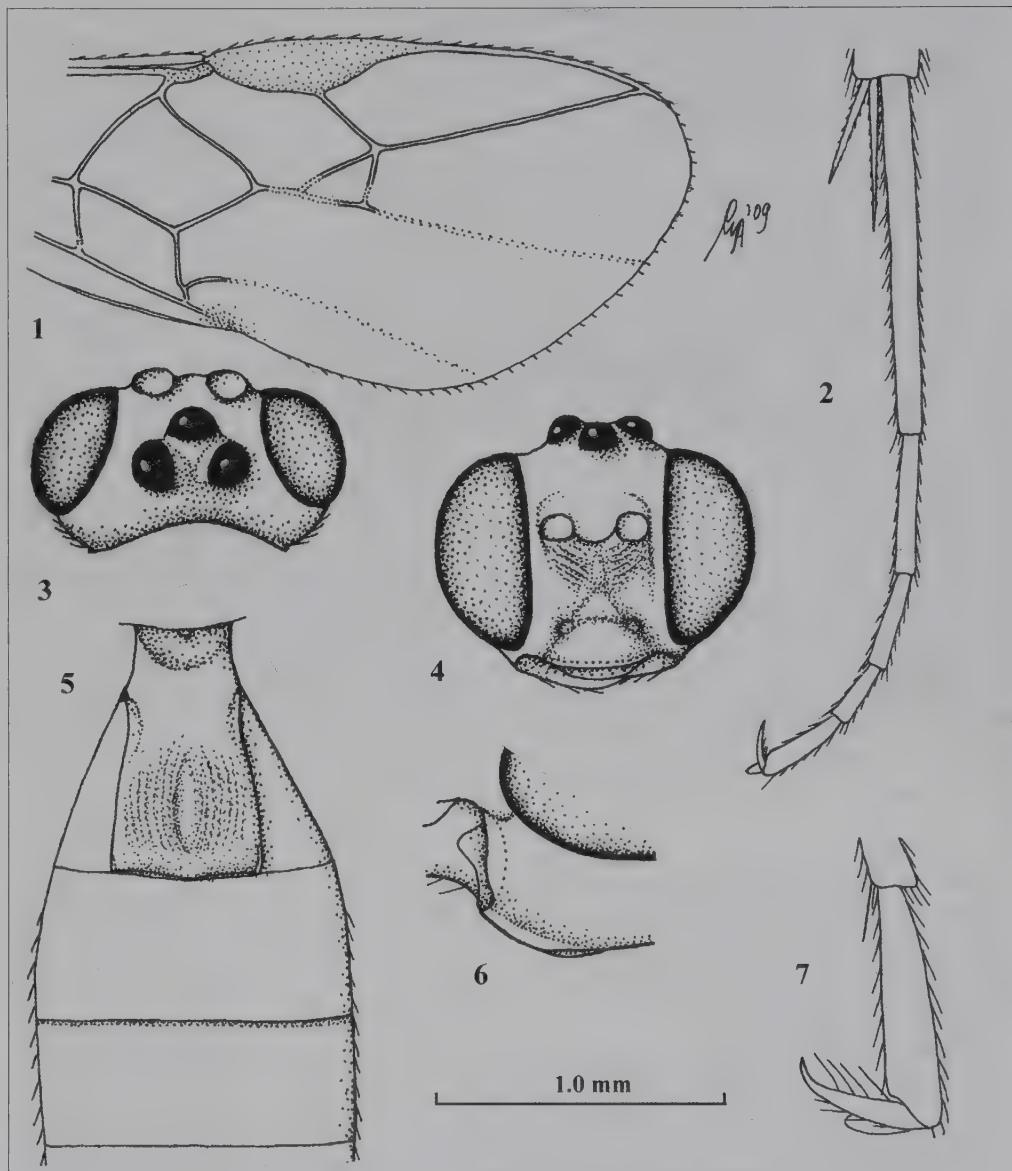
Specimens examined: Holotype: ♀, “United Arab Emirates, Wadi Safad, 25°13'N 56°19'E, 2–26.i.2006, (5015), white & yellow pan tr[ap], A. v. Harten, RMNH'06”, (RMNH). Paratypes (425♂ and 340♀): 3♀, same data as holotype; 1♀, same locality as holotype but 26.xii.2005–2.i.2006, WT; 2♂, 2f, 31.i.–21.ii.2006, LT. 17♂, 2♀, al-Ajban, 7–28.xii.2006, MT & LT; 5♂, 1♀, 28.xii.2005–29.i.2006, MT & LT; 1♂, 2♀, 26.ii–27.iii.2006, MT & LT. 6♂, 14♀, Bithnah, 11.xii.2005–18.i.2006, LT; 2♂, 30.xii.2005–2.ii.2006, LT. 1♂, SSW of ad-Dhaid, 23.iv.2005, at light, leg. A. van Harten & K. Szpila; 9♂, 3♀, 2–14.ix.2006, LT. 1♂, Fujairah, 13–19.iv.2005, LT; 1♀, 5–24.iii.2005, LT; 1♀, 2–13.v.2005, LT. 1♂, 1♀, Hatta, 22–29.i.2006. LT. 1♂, 1♀, Sharjah, 6–30.vi.2005, LT. 1♀, Sharjah Desert Park, 10.xi.2004, LT; 10♂, 11♀, 13–23.iv.2005, LT; 5♂, 25.i–22.ii.2005, LT; 10♂, 4♀, 22.ii–9.iii.2005, LT; 11♂, 8♀, 9–21.iii.2005, LT; 46♂, 41♀, 21–29.iii.2005, LT; 66♂, 45♀, 29.iii–6.iv.2006, LT; 24♂, 23♀, 6–13.iv.2005, LT; 14♂, 3♀, 23–30.iv.2005, LT; 4♂, 2♀, 30.iv–7.v.2005, LT; 6♂, 3♀, 30.iv–31.v.2005,



Plate 1. *Microtypus vanharteni* van Achterberg nov. spec., female, holotype, UAE (Wadi Safad). (Scale-line = 1 mm).

LT; 1♂, 1♀, 20.x–8.xi.2005, LT; 3♂, 3♀, 11.xii.2005–18.i.2006, LT; 1♀, 20–21.iv.2006, LT, leg. M. Fibiger; 2♂, 1♀, 25.ii–25.iii.2006, LT; 1♀, 1–25.ii.2006, LT. 6♂, 10♀, Sharjah-Khor Kalba, near tunnel, 16–31.i.2006, LT; 1♀, 7–22.ii.2006, LT. 30♂, 38f, NARC, near Sweihan, 14–28.iii.2005, LT; 28♂, 25♀, 28.iii–2.iv.2005, LT; 10♂, 12♀, 2–9.iv.2005, LT; 28♂, 22♀, 9–20.iv.2005, LT; 39♂, 36♀, 1.ii–14.iii.2005; 11♂, 18♀, 20–30.iv.2005, LT; 2♂, 26.ii–2.iv.2006, LT. 1♂, Wadi Maidaq, 21.xii.2005–2.ii.2006, LT.

Description: Female, holotype, length of fore wing 5.5 mm and of body 6.1 mm. Head. Antenna with 41 segments, as long as fore wing, with short adpressed setae, third segment 1.1 times as long as fourth segment, length of third, fourth and penultimate segments 2.4, 2.2 and 1.8 times as long as wide, respectively; maxillary palp 0.9 times as long as height of head; occipital carina nearly complete, only medio-dorsally interrupted; length of eye in dorsal view 3.2 times temple; temples directly narrowed behind eyes (Fig. 3); ocelli strongly protuberant, anterior ocellus close to posterior ocelli (Fig. 3), OOL:diameter of ocellus:POL = 3:7:5; frons largely flat and largely smooth medially but anteriorly with a few rugae and laterally punctulate and setose; vertex setose, flat (but depressed near ocelli) and punctulate; face weakly convex (including triangular area above clypeus) and with oblique rugae and punctures dorsally; clypeus weakly convex and sparsely punctate and its ventral margin thin, straight and near lower level of eyes (Fig. 4); anterior tentorial pits large; occipital flange comparatively narrow and not protruding in lateral view (Fig. 6); length of malar space 0.3 times basal width of mandible; malar suture absent except for a shallow depression.



Figures 1–7. *Microtypus vanharteni* van Achterberg nov. spec., female, holotype. 1: Part of fore wing; 2: Hind tarsus; 3: Head, dorsal aspect; 4: Head, anterior aspect; 5: First–third metasomal tergites, dorsal aspect; 6: Malar space, antero-lateral aspect; 7: Outer hind claw. 1: 0.6 \times scale-line; 2: 1.8 \times ; 3–5: 1.0 \times ; 6: 2.0 \times ; 9, 16: 2.6 \times .

Mesosoma. Length of mesosoma 1.4 times its height; side of pronotum smooth dorsally, except for a few crenulae in dorsal groove, remainder punctate and with some rugae antero-ventrally and distinctly rugose posteriorly; mesosternal suture rather narrow and densely crenulate; epicnemial area smooth; precoxal sulcus absent (except for a depression medially

and posteriorly), remainder of mesopleuron smooth (except for some very fine punctulation) and setose; metapleuron punctulate medially and few rugae ventrally; metapleural flange narrow, cariniform; notauli complete and densely crenulate; mesoscutal lobes smooth and largely densely setose; scutellar sulcus wide and with one carina medially; scutellum convex, largely smooth and with some punctulation; surface of propodeum antero-laterally and posteriorly smooth (except for the carinae), medio-anteriorly and medially rugose and with an irregularly indicated areola and with a weak and short median carina.

Wings. Fore wing: 1-SR medium-sized and somewhat widened; r:SR1:2-SR:r-m = 15:54:17:10; second submarginal cell with short and somewhat widened petiolaris (Fig. 1); 1-SR+M slightly sinuate; r long and oblique, 1.5 times longer than width of pterostigma; cu-a subinterstitial, inclivous and long; 3-CU1 inclivous; basal half of subbasal cell sparsely setose and remainder moderately setose. Hind wing: cu-a nearly vertical; marginal cell slightly widened apically; M+CU:1-M:1r-m = 20:7:8; subbasal cell sparsely setose.

Legs. Hind coxa superficially punctulate and dorsally with a few oblique rugae; tarsal claws slender, with apex curved (Fig. 7); length of femur, tibia and basitarsus 5.9, 10.2 and 13.2 times their maximum width respectively; length of hind tibial spurs 0.3 and 0.4 times hind basitarsus; hind basitarsus with medium-sized setae and ventrally with some longer bristly setae (Fig. 2).

Metasoma. Length of first tergite 1.6 times its apical width, hardly narrowed behind spiracles (Fig. 5), surface of posterior half largely superficially finely rugose, medially rather depressed and basally concave, its dorsal carinae absent; laterope shallow and large; second tergite smooth; second suture distinct and narrow; third and following tergites smooth; second tergite only basally with lateral crease; length of ovipositor sheath 0.53 times as long as fore wing.

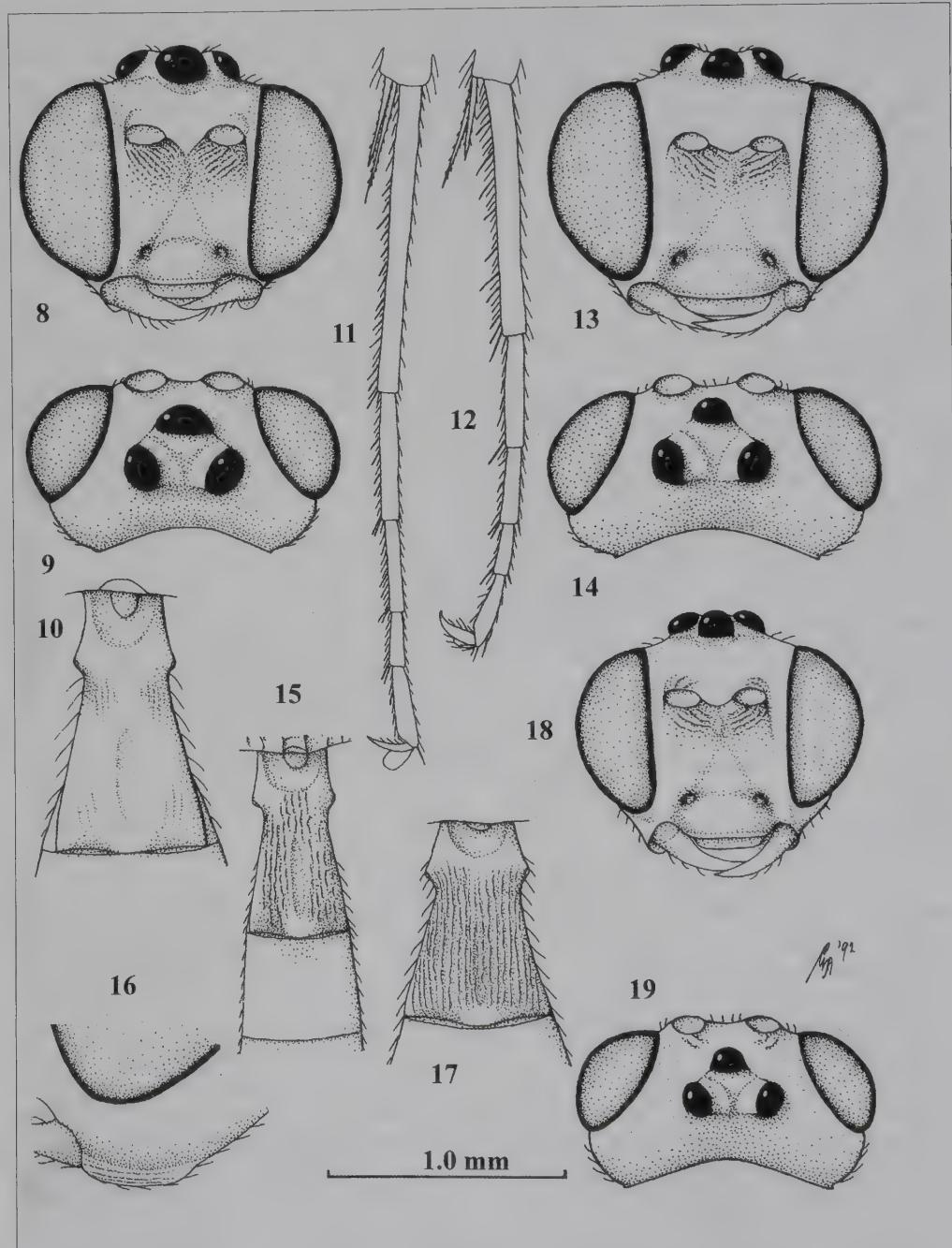
Colour. Pale brownish-yellow; antenna (except scapus and pedicellus) slightly darker than scapus and more or less brown, as mesopleuron and mesosternum; ovipositor sheath dark brown; wing membrane hyaline; veins of apical 0.6 of fore wing rather dark brown, remainder of vein yellowish; pterostigma pale yellow but borders (except anteriorly) narrowly dark brown.

Variation. Length of fore wing 2.5–5.5 mm, of body 2.8–6.1 mm; antenna of female with 35 (1), 36 (6), 37 (11), 38 (14), 39 (8), 40 (14), 41 (7) or 42 (2) segments, of male 34 (2), 36 (13), 37 (8), 38 (12), 39 (12) 40 (6) or 41 (5) segments; length of malar space 0.2–0.3 times basal width of mandible; length of antenna 1.0–1.2 times length of fore wing; POL of males sometimes longer than diameter of posterior ocellus; first metasomal tergite hardly to distinctly narrowed behind spiracles; vein r of fore wing 1.1–1.5 times width of pterostigma; length of hind basitarsus 12–15 times its apical width; apical half of first tergite superficially rugose, but sometimes distinctly so; ovipositor sheath 0.5–0.6 times as long as fore wing; stemmaticum brownish yellow to black; stemmaticum, mesopleuron anteriorly, metapleuron, propodeum and metasoma largely may be dark brown or blackish, sometimes in female partly infuscate; extreme melanistic specimens have the clypeus dorsally, face ventrally, middle of frons and vertex and stemmaticum black and hind coxa and prothorax partly dark brown; rarely the mesosoma is nearly completely black and the metasoma is dorsally dark brown.

Remarks: Closely related to *M. desertorum* Shestakov, 1932, but *M. vanharteni* differs by the more slender legs (length of hind basitarsus 12–15 times its apical width), the larger ocelli (POL shorter than diameter of posterior ocellus) and the more sculptured first metasomal tergite.

Distribution: UAE.

Etymology: Named in honour of its collector, Tony van Harten, for his enormous contribution to the knowledge of Hymenoptera from the UAE.



Figures 8–19. 8–11, *Microtypus algirus* Szépligeti, female, Jordan. 12–14, *M. desertorum* Shestakov, female, Mongolia. 15: *M. trigonus* (Nees), female, neotype. 16: *M. wesmaelii* Ratzburg, female, Netherlands. 17–19: *M. petiolatus* van Achterberg, female, holotype. 8, 13, 18: Head, anterior aspect; 9, 14, 19: Head, dorsal aspect; 11, 12: Hind tarsus; 10, 15, 17: First metasomal tergite, dorsal aspect; 16: Malar space, antero-lateral aspect. 8–11, 17–19: 1.0× scale-line; 12–14: 1.2×; 15: 1.4×; 16: 1.8×.

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Order Hymenoptera, family Bethylidae

Celso O. Azevedo, Isabel D. C. C. Alencar and Diego N. Barbosa

INTRODUCTION

Here we deal with the family Bethylidae, all parasitoids of larvae of Lepidoptera and Coleoptera, except for two genera that parasitize Hymenoptera. The family is widely distributed throughout the world, being found in all zoogeographic regions, but the majority of species occur in tropical areas (Azevedo, 1999). Some 1800 species have been described. Finnamore & Brothers (1993) estimated that this number does not represent more than 30% of the group's actual size. Azevedo (2006) estimated 3,000 species to occur in the Neotropical region alone. There are no records of bethylids from the UAE. Until now only the species *Metrinotus szelenyi* Móczár, 1970, has been recorded from Arabian Peninsula (Yemen).

MATERIALS AND METHODS

A total of 5,826 specimens of Bethylidae were collected and sorted by A. van Harten. Most of them are collected by light traps and Malaise traps, which is the most efficient collecting method for bethylids according to Noyes (1989) and Azevedo et al. (2003). For details see the chapter 'Collecting methods and localities' in Volume 1 (van Harten, 2008). He also collected material from Yemen, which generic results have been published by Azevedo & Guimarães (2006). The specimens from the UAE were point-mounted. The specimens are deposited in the Universidade Federal do Espírito Santo Insect Collection and the UAE Invertebrate Collection.

The identification of bethylid species is strongly based on male genitalia. In some cases, the precise identification of a bethylid genus is possible only through the analysis of the genitalia. We choose to present our preliminary results at genus level since extracting and clearing genitalia of thousands of bethylids will take a long time. In addition, species revisions, especially for large genera, are beyond the scope of the present work, but are necessary before species names can reliably be applied to most of the Bethylidae of the UAE. It will be necessary to understand the fauna from the Oriental, Ethiopian and Palaearctic regions in order to be sure of the identification of the bethylid species, since species from all three regions can range through the Arabian Peninsula.

SYSTEMATIC ACCOUNT

Key to the genera of Bethylidae of the UAE

- 1 Fore wing with veins Rs & M obtusely angled or giving rise to a vein (Rs+M) or vein stub (Plate 16), sometimes with an enclosed discal cell (Bethylinae) ... **Goniozus** Förster
- Fore wing with veins Rs & M simple (Plates 21, 23), straight or evenly arched, not angled or giving rise to any vein or stub, sometimes without veins Rs & M (macropterous, brachypterous or apterous) 2
- 2 Second metasomal tergite very large (Plates 45, 49), accounting for about half of length of metasoma in dorsal view (Mesitiinae) 3

- Second metasomal tergite not conspicuously large, accounting much less than half of length of metasoma in dorsal view 4
- 3** Median clypeal carina simple (Plate 17); posterior corner of propodeal disc with distinct spine directed backward (Plate 18) ***Heterocoelia*** Dahldom
- Median clypeal carina spoon-shaped (Plate 24); posterior corner of propodeal disc without any spine ***Mesitius*** Spinola
- 4** Male macropterous; scutellum not in contact with propodeum (Plate 32), metanotum medially developed with emargination or fovea opposite posterior apex of scutellum. Female apterous, without tegula or ocelli; eye small or absent, eye height up to 0.25 of head width; propodeum often constricted anteriorly (most of Pristocerinae) 5
- Both sexes macropterous, brachypterous or apterous, if apterous then usually with tegula and ocelli; scutellum in contact with propodeum or nearly so (Plates 10, 12), metanotum occasionally narrowly transverse but without fovea opposite posterior apex of scutellum; female with eye height more than 0.25 of head width; female propodeum not constricted anteriorly (Epyrinae) 13
- 5** Females without wings, tegula or ocelli (Plates 40, 51, 53) 6
- Males macropterous, with tegula and ocelli (Plates 39, 52, 54) 9
- 6** Propodeum strongly constricted at its extreme anterior end; mesonotum elongate, mesopleuron not reach propodeum in dorsal view; eye with zero or one facet ***Pseudisobrachium*** Kieffer
- Propodeum not constricted at anterior end, broadly in contact with mesonotum, constricted at or near spiracles if at all; mesonotum short, mesopleuron reaches at least anterior third of propodeum in dorsal view; eye with more than one facet (some exceptions) 7
- 7** Mesopleuron, seen in dorsal view, very narrow; thorax barely wider across mesothorax than across prothorax; propodeum more or less parallel-sided, at most weakly constricted (Plate 40) ***Dissomphalus*** Ashmead
- Mesopleuron, seen in dorsal view, quite large; thorax distinctly wider than elsewhere; propodeum with evident constriction at or near spiracles 8
- 8** Propodeal disc with anterior strong constriction, maximum width at least 2.0× constriction width (Plate 30) ***Pristocera*** Klug
- Propodeal disc with weak to moderate constriction, maximum width rarely up to 1.9× constriction width ***Parascleroderma*** Kieffer
- 9** Hypopygium almost completely divided longitudinally into two lobes (Plate 29) ***Pristocera*** Klug
- Hypopygium at most with posterior margin strongly concave 10
- 10** Mesothorax without acetabular carina (Plate 26); fore wing with basal vein reaching subcostal vein far from pterostigma (Plate 27) ***Parascleroderma*** Kieffer
- Mesothorax with acetabular carina; fore wing with basal vein reaching subcostal vein near pterostigma 11
- 11** Paramere completely divided into two arms; basivolsella with vannus; aedeagus not divided in ventral ramus and dorsal body ***Pseudisobrachium*** Kieffer
- Paramere not completely divided into two arms; basivolsella without vannus; aedeagus divided in ventral ramus and dorsal body 12
- 12** Metasoma usually with tergal process (tubercl, pit, depression, tuft) on segment II (Plate 8); volsella completely fused to basiparamere ***Dissomphalus*** Ashmead
- Metasoma without such process; volsella outlined ***Pristocerinae*** (cf. *Apenesia* Westwood)

- 13** Antenna with ten flagellomeres 14
 – Antenna with eleven flagellomeres 15
- 14** Fore wing with submedian cell closed (Plate 21) *Israelius* Richards
 – Fore wing with submedian cell open (Plate 2) *Cephalonomia* Westwood
- 15** Clypeus with median lobe continuous with frons (Plate 14); female mandible with seven apical teeth and upper margin dentate; male mandible with five apical teeth and upper margin not dentate; paramere completely divided into two arms *Glenosema* Kieffer
 – Clypeus inserted beneath frons; female and male with mandibular teeth number variable; paramere not usually completely divided into two arms 16
- 16** Scutellum with pair of pits usually separated (Plate 10), occasionally connected by narrow and shallow line 17
 – Scutellum with undivided, basal transverse groove, straight or arched backward at each end (Plate 12) 18
- 17** Antennal scape with strong setae; mandible with ventral translucent membrane (Plate 35) *Tracheypyris* Kieffer
 – Antennal scape without strong setae; mandible without membrane
 *Epyris* Westwood
- 18** Fore wing with radial vein very short, at most about as long as basal vein (Plates 5, 23) .. 19
 – Fore wing with radial vein clearly longer than basal vein 20
- 19** Head (Plate 22), dorsum of thorax and fore wing with thick and long setae; mesopleural postpectal area not striate; fore tarsus without delicate long spines *Laelius* Ashmead
 – Body and wings without such setae; mesopleural postpectal area distinctly costulate; fore tarsus of females with delicate long spines (Plate 6) *Diseypyris* Kieffer
- 20** Clypeus with three prominent lobes (Plate 19), lateral lobes usually wider than median one; notaulus usually incomplete and weak *Holeypyris* Kieffer
 – Clypeus with only median lobe well developed, lateral lobes absent or small; notaulus usually conspicuous 21
- 21** Mesonotum (Plate 12) with transverse depression or line of foveae; scutellar groove wide and scrobiculate *Formosieypyris* Terayama
 – Mesonotum without any transverse modification; scutellar groove narrower than lateral pits, not scrobiculate *Rhabdeypyris* Kieffer

Genus *Cephalonomia* Westwood, 1855

Plates 1–2, 37

Cephalonomia has 40 valid species around the world. They are parasitoids of beetles, mainly on mycetophagous beetles as ciids, bark beetles, and beetles occurring in stored grain (Evans, 1964). *C. stephanoderis* Betrem, 1961, is an important agent for the biological control of the coffee berry borer *Hypothenemus hampei* (Ferrari, 1867) (Coleoptera, Scolytidae). In total 43 specimens of this genus were found, less than 1% of all UAE bethylids collected. At least two species were found.

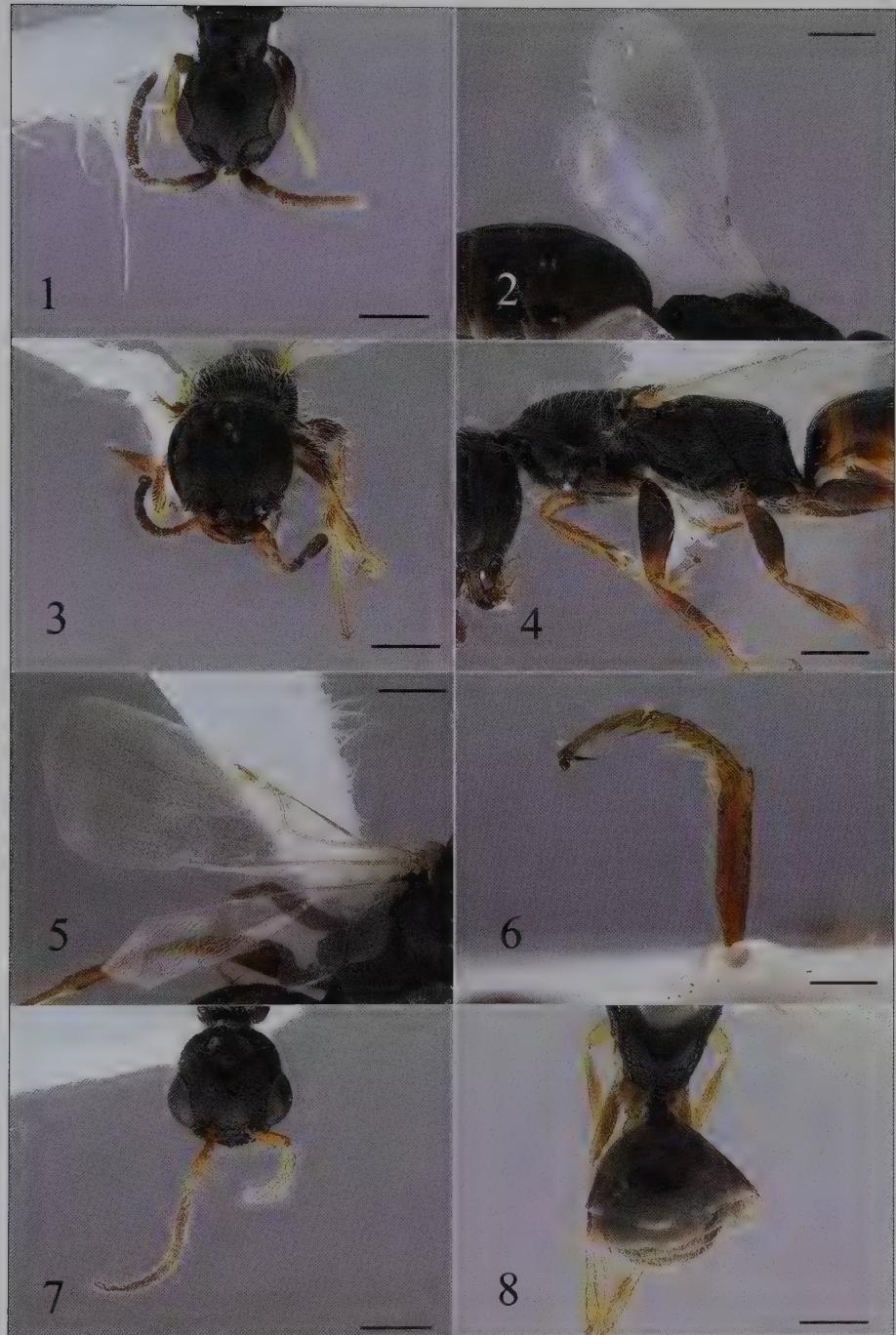
Genus *Diseypyris* Kieffer, 1905

Plates 3–6, 38

Diseypyris has only four valid species (two in India, one in Sudan and one in Algeria). No hosts are yet recorded for this genus. In total 82 specimens of this genus were found, about 1.4% of all UAE bethylids collected.

Genus *Dissomphalus* Ashmead, 1893

Dissomphalus has 243 valid species around the world. Biological data on several species suggest that *Dissomphalus* is a parasitoid of myrmecophilous or wood boring beetle larvae



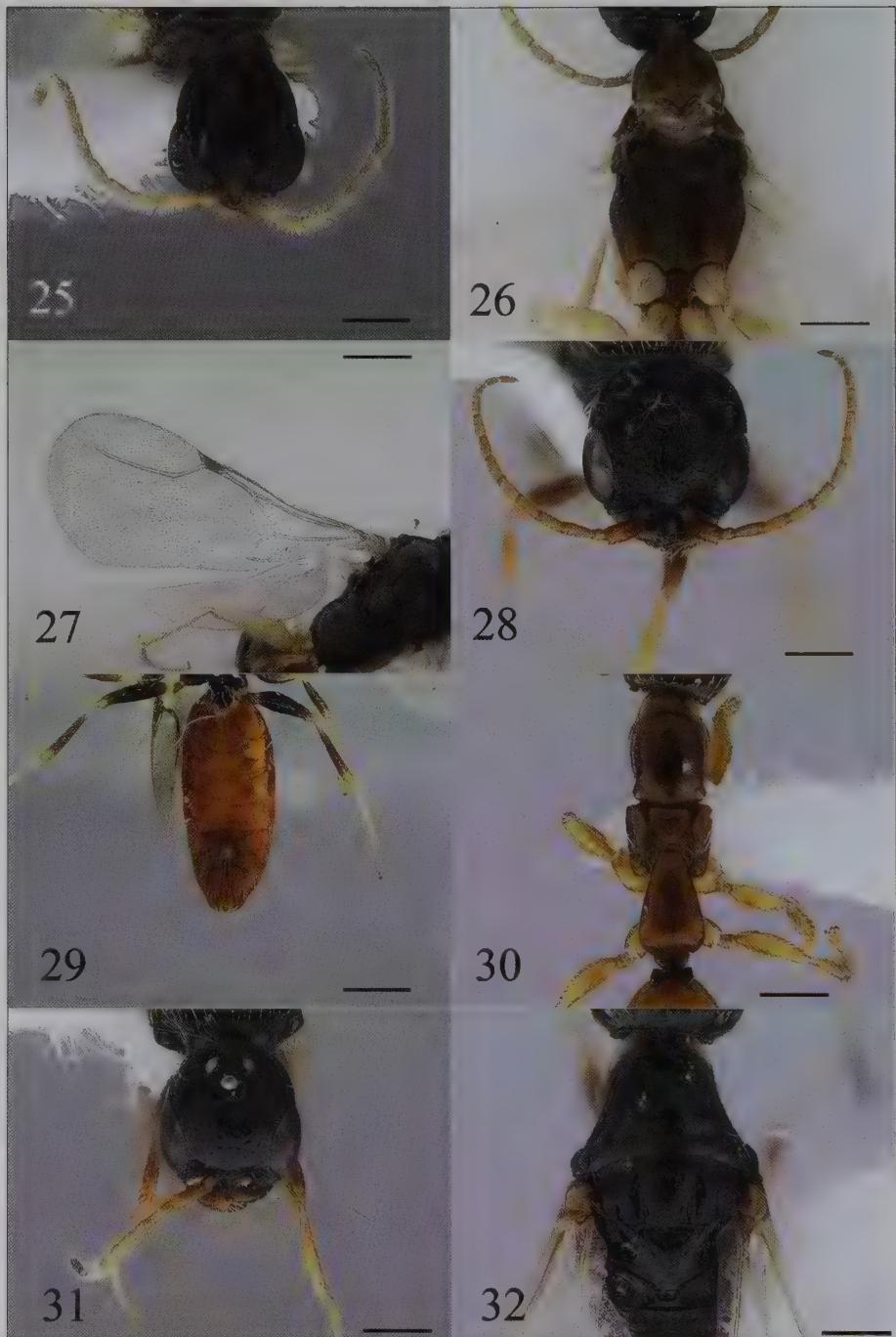
Figures 1–8. 1–2. *Cephalonomia* Westwood. 1: Head in dorsal view; 2: Wing in dorsal view; 3–6. *Disepyris* Kieffer. 3: Head in dorsal view; 4: Mesopleuron in lateral view; 5: Wing in dorsal view; 6: Tarsus in lateral view; 7–8. *Dissomphalus* Ashmead. 7: Head in dorsal view; 8: Metasoma in dorsal view. Scale bar = 0.50 mm.



Plates 9–16. 9–10. *Epyris* Westwood. 9: Head in dorsal view, 10: Propodeum in dorsal view; 11–13. *Formosiepyris* Terayama: 11: Head in dorsal view, 12: Mesonotum in dorsal view, 13: Mesopleuron in lateral view; 14. *Glenosema* Kieffer: Head in dorsal view; 15–16. *Goniozus* Förster. 15: Head in dorsal view; 16: Wings in dorsal view. Scale bar = 0.50 mm.



Plates 17–24. 17–18. *Heterocoelia* Dahlbom. 17: Head in dorsal view, 18: Propodeum in dorsal view; 19. *Holepyris* Kieffer: Head in dorsal view; 20–21. *Israelius* Richards. 20: Head in dorsal view, 21: Wing in dorsal view; 22–23. *Laelius* Ashmead. 22: Head in dorsal view; 23: Wing in dorsal view; 24. *Mesitius* Spinola: Head in dorsal view. Scale bar = 0.50 mm.



Plates 25–32. 25–27. *Parascleroderma* Kieffer. 25: Head in dorsal view; 26: Mesosternum in ventral view; 27: Wing in dorsal view; 28–30. *Pristocera* Klug. 28: Head in dorsal view; 29: Metasoma in ventral view; 30: Mesosoma in dorsal view (female); 31–32. *Pristocerinae* (cf. *Apenesia* Westwood). 31: Head in dorsal view; 32: Mesoscutum in dorsal view. Scale bar = 0.50 mm.



Plates 33–36. 33. Pristocerinae (cf. *Apenesia* Westwood): Wing in dorsal view; 34. *Pseudisobrachium* Kieffer: Head in dorsal view; 35–36. *Tracheepyris* Kieffer. 35: Head in dorsal view; 36: Legs in lateral view. Scale bar = 0.50 mm.

(Krombein, 1979). In total 11 specimens of this genus were found, less than 1% of all UAE bethylids collected. This genus is usually more predominant in humid habitats (Mugrabi et al., 2008).

Genus *Epyris* Westwood, 1832

Plates 9–10, 41

Epyris has 272 valid species around the world. So far as is known, *Epyris* attacks beetle larvae (Rubink & Evans, 1979). The females are predators. They prepare simple nests on the ground and drag small larvae into it (Williams, 1919; Rubink & Evans, 1979). This behaviour is very unusual within the bethylids. This genus was the second most common and one of the most diverse in this sample with about 1,130 specimens, 19.4% of all UAE bethylids collected.

Genus *Formosiepyris* Terayama, 2004

Plates 11–13, 42

Formosiepyris has only four valid, Oriental species (from China, Taiwan, India and Thailand). No hosts have yet been recorded for this genus. Although this genus has been described recently and its few species are from the Far East Oriental region, it was the third most common genus in this sample with 954 specimens, about 16.4% of all UAE bethylids collected.

Genus ***Glenosema*** Kieffer, 1905

Plates 14, 43

Glenosema has 15 valid species around the world, but of only two species the males are known. The hosts are not known. Here 102 male specimens were recorded, representing 1.75% of all UAE bethylids collected.

Genus ***Goniozus*** Förster, 1856

Plates 15–16, 44

Goniozus has 166 valid species around the world. Most *Goniozus* species parasitize Lepidoptera (Evans, 1978). However, there are isolated records of attacks of beetle larvae and one of Hymenoptera (Melo & Evans, 1993). In total 142 specimens of this genus were found, about 2.4% of all UAE bethylids collected.

Genus ***Heterocoelia*** Dahlbom, 1854

Plates 17–18, 45

Heterocoelia has 32 valid species around the Old World. No hosts have yet been recorded for this genus. Only seven specimens of this genus were found, less than 1% of all UAE bethylids collected.

Genus ***Holepyris*** Kieffer, 1905

Plates 19, 46

Holepyris has 130 valid species around the world. As far as is known, *Holepyris* attacks beetle or moth larvae (Evans, 1964). This genus was the most common one in this sample with 1,780 specimens collected, about 33.8% of all UAE bethylids.

Genus ***Israelius*** Richards, 1952

Plates 20–21, 47

Israelius is a monotypic genus. The single species, *I. carthami* Richards, 1952, was bred from the anobiine beetle *Lasioderma serricorne* (Fabricius, 1792) (Richards, 1952). Five specimens of this genus were found, less than 1% of all UAE bethylids collected.

Genus ***Laelius*** Ashmead, 1893

Plates 22–23, 48

Laelius has 27 valid species around the world, with the exception of South America and Australia. All species of which the hosts are known attack larvae of Dermestidae (Coleoptera) (Vikberg & Koponen, 2005). A total of 950 specimens of this genus were found, 16.3% of all UAE bethylids collected. A new species of *Laelius* from the UAE is described in this volume (Azevedo & Barbosa, 2010).

Genus ***Mesitius*** Spinola, 1851

Plates 24, 49

Mesitius has 15 valid species recorded from the Old World. The hosts are not known. The striking material from the UAE represents an unusual species of *Mesitius* with propodeal disc without spines. This character represents the most remarkable one within this subfamily. In total 36 specimens of this genus (probably one single new species) were found, less than 1% of all UAE bethylids collected.

Genus ***Parascleroderma*** Kieffer, 1904

Parascleroderma has 29 species occurring in all zoogeographic regions, although the genus has never been recorded from Asia. The available records suggest that *Parascleroderma* species parasitize beetle larvae that live under bark or in crevices in wood (Evans, 1964). A total of 88 specimens of this genus were found, about 1.5% of all UAE bethylids collected.

Genus ***Pristocera*** Klug, 1808

Plates 28–30, 52–53

Pristocera has 82 valid species around the Old World. There is only one host record for this genus in its present configuration: Terayama (1996) reported *P. rufa* Kieffer, 1906,

parasitizing the larva of a Curculionidae (Coleoptera). A total 72 specimens of this genus were found, about 1.2% of all UAE bethylids collected.

Pristocerinae (cf. genus *Apenesia* Westwood, 1874)

Plates 31–33, 54

The cosmopolitan genus *Apenesia* has 184 valid species. The hosts are not known. The striking material from the UAE has the general body characters and genitalia as *Apenesia*. However, the aedeagus has a pair of ventral laminae, which resembles the ventral ramus present in the genitalia of *Dissomphalus*. Only nine specimens of this genus (one species) were found, less than 1% of the UAE bethylids collected.

Genus ***Pseudisobrachium*** Kieffer, 1904

Plates 34, 55

Pseudisobrachium has 158 valid species around the world. There exist no studies on the life-history of any *Pseudisobrachium* species. Ashmead (1893) found some *Pseudisobrachium* spp. associated with ant and beetle larvae, but there still is no confirmation that these larvae are used as hosts (Evans, 1964). In total 17 specimens of this genus were found, less than 1% of all UAE bethylids collected.

Genus ***Rhabdepyris*** Kieffer, 1904

Rhabdepyris has 130 valid species around the world. The life-history of *Rhabdepyris* is unknown. Some species were collected in association with ants, but there is no evidence that ants are used as hosts (Evans, 1964). Only six specimens of this genus were found, less than 1% of all UAE bethylids collected.

Genus ***Tracheypyris*** Kieffer, 1905

Plates 35–36, 56

Tracheypyris has 11 valid species recorded from the Old World. No hosts are yet recorded for this genus. In total 391 specimens of this genus were found, about 6.7% of all UAE bethylids collected.

FAUNAL RELATIONS

Based on the zoogeographical distribution data herein obtained, the genera of Bethylidae occurring in UAE may be classified as follows:

-  Exclusively Oriental genus: *Formosiepyris*.
- Cosmopolitan or widely distributed genera: *Cephalonomia*, *Dissomphalus*, *Epyris*, *Goniozus*, *Holepyris*, *Laelius* (never recorded from Ethiopian region), *Parascleroderma*, *Pseudisobrachium*, *Rhabdepyris* and *Sclerodermus*.
- Genera occurring in the Old World: *Heterocoelia*, *Pristocera*, *Tracheypyris*.
- Genera common in both Oriental and Ethiopian regions: *Disepyris*.

Our new data added to those obtained for Yemen (see Azevedo & Guimarães, 2006) indicate that there may be an exchange of bethylid fauna between the Palaearctic part of Eurasia and the Mediterranean part of Africa via the Arabian Peninsula, where the UAE is located. The bethylid composition on the Palaearctic part of Africa is quite distinct from the Ethiopian composition. On the other hand, the Mediterranean part presents similarities to the composition found in the UAE. The presence of Oriental genus *Formosiepyris* and Oriental-Ethiopian genus *Disepyris* in the UAE emphasizes the connection of the Arabian Peninsula to the Oriental region.

In spite of being located in an arid territory with little rainfall, the UAE presents a great potential of bethylid diversity. Supporting this affirmation is the fact that, in a first systematic attempt to study the bethylid fauna in the UAE, 15 genera were collected, which is relatively significant. The figures of species in the areas surrounding the Arabian Peninsula also evidence the enormous lack of knowledge about these parasitoid wasps in that area and the need for a more intense sampling effort. According to those figures (see the list presented at the end of this chapter), there are 77 species as follows:

- 38 species occurring from the Arabian Peninsula towards the West into NE Africa (Egypt, Ethiopia, Eritrea, Sudan, Somalia).
- 33 species occurring from the Arabian Peninsula towards the North (Syria, Israel, Iraq, Turkey).
- 13 species occurring from the Arabian Peninsula towards the North-East into Asia (Iran, Pakistan, Afghanistan).
- 1 species occurring only in the Arabian Peninsula (Yemen).

The lack of worldwide collecting limits the improvement of the systematics of these wasps, which often seem to be restricted to specific regions of the planet. Hopefully, in the future such research will be encouraged in the UAE, since as a part of the Arabian Peninsula it constitutes an important zoogeographical bridge between Africa and Asia, as already noted by Olmi & van Harten (2000) for Dryinidae, Embolemidae and Sclerogibbidae and by Azevedo (2006) for Bethylidae.

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37



38

Plates 37–38. 37: *Cephalonomia* Westwood, female, habitus; 38: *Disepyris* Kieffer, female, habitus.
Scale bar = 1.00 mm.

39



40



Plates 39–40. *Dissomphalus* Ashmead, 39: Male, habitus; 40: Female, habitus. Scale bar = 0.50 mm.

41



42



Plates 41–42. 41: *Epyris* Westwood, female, habitus; 42: *Formosiepyris* Terayama, female, habitus. Scale bar = 0.50 mm.

43

44



Plates 43–44. 43: *Glenosema* Kieffer, male, habitus; 44. *Goniozus* Förster, female, habitus. Scale bar = 0.50 mm.

45



46



Plates 45–46. 45: *Heterocoelia* Dahlbom, female, habitus; 46. *Holepyris* Kieffer, female, habitus. Scale bar = 0.50 mm.

47



48



Plates 47–48. 47: *Israelius* Richards, female, habitus; 48. *Laelius* Ashmead, female, habitus. Scale bar = 0.50 mm.



49



50

Plates 49–50. 49: *Mesitius* Spinola, female, habitus; 50. *Parascleroderma* Kieffer, male, habitus. Scale bar = 0.50 mm.



51



52

Plates 51–52. 51: *Parascleroderma* Kieffer, female, habitus; 52. *Pristocera* Klug, male, habitus. Scale bar = 0.50 mm.



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Plates 53–54. 53: *Pristocera* Klug, female, habitus; 54: *Pristocerinae* (cf. *Apenesia* Westwood), male, habitus. Scale bar = 0.50 mm.

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56



Plates 55–56. 55: *Pseudisobrachium* Kieffer, male, habitus; 56: *Tracheypyris* Kieffer, female habitus.
Scale bar = 0.50 mm.

Annex 1. List of species of Bethylidae from the Arabian Peninsula and surrounding countries (Data extracted from Gordh & Moczar, 1990. After this year, no records for this area were added.)

	Eg	Su	Er	Et	So	Y	Is	Sy	T	Iq	In	A	P
<i>Afgoiogfa olmiana</i> Argman	X	.	.	.	.	.	.	.
<i>Anaylax aegyptius</i> Moczar, 1978	X	.	.	.	.	.	.	.	.	.	.	.	.
<i>Anaylax dalmaticus</i> Moczar, 1970	X	.	.	.	.	.	.	.	.	.	.	.	.
<i>Anaylax integer</i> (Kieffer, 1906)	-	.	.	.	X	.	.
<i>Anaylax moczari</i> (Nagy)	-	.	.	X	.	X	.
<i>Apenesia aegyptia</i> (Kieffer, 1921)	.	X	.	.	.	.	-	.	.	.	.	.	.
<i>Bethylus gaullei</i> Kieffer, 1905	X	.	.	.	.	.	.
<i>Cephalonomia hypohori</i> Kieffer	X	.	.	.	X	.	.
<i>Cephalonomia tarsalis</i> (Ashmead, 1893)	X	.	.	.	.	.	.
<i>Dicrogenium aethiopicum</i> Benoit, 1963	.	.	.	X	.	.	.	.	.	.	.	.	.
<i>Dicrogenium armaticeps</i> (Turner, 1915)	.	.	.	X	.	.	.	.	.	.	.	.	.
<i>Dicrogenium spiniceps</i> Masi, 1939	.	.	.	X	.	.	.	.	.	.	.	.	.
<i>Disepyris afer</i> (Magretti)	.	X	.	.	.	.	.	.	.	.	.	.	.
<i>Dissomphalus claudivani</i> Argaman	X	.	.	.	.	.
<i>Epyris aegypticus</i> Kieffer, 1921	.	X	.	.	.	-	.	.	.	.	.	.	.
<i>Epyris apicalis</i> (Motschulsky)	X	.	.	.	.	.	.	-	.	.	.	.	.
<i>Epyris bicolor</i> Fouts, 1934	X	.	.	.	.	.	.	.	.
<i>Epyris ebneri</i> Kieffer, 1921	.	X	.	.	.	.	.	.	.	.	.	.	.
<i>Epyris geniculatus</i> Kieffer, 1904	.	.	X	.	.	.	.	.	.	.	.	.	.
<i>Epyris marshalli</i> Kieffer, 1906	X	.	.	.	.	.	.
<i>Epyris niger</i> Westwood, 1832	X	.	.	.	.	.	.	.	.	.	.	.	.
<i>Epyris penetatus</i> Kieffer	X	.	.
<i>Epyris pilosipes</i> Kieffer	X	.	.	.	.	.	.
<i>Epyris politus</i> (Motschulsky)	X	.	.	.	.	.	.	.	.	.	.	.	.
<i>Epyris quinquecarinatus</i> Kieffer, 1906	X	.	.	.	.	.	.	.	.	.	.	.	X
<i>Epyris ruficollis</i> Ashmead	X
<i>Epyris transversus</i> Kieffer, 1906	X	.	.	.	.	.	.
<i>Epyris wanei</i> Risbec	.	X	.	.	.	.	.	.	.	.	.	.	.
<i>Glenosema niloticus</i> (Kieffer)	.	X	.	.	.	.	.	.	.	.	.	.	.
<i>Goniozus aethiops</i> Evans, 1976	.	.	.	X	.	.	.	.	.	.	.	.	.
<i>Goniozus gestroi</i> (Kieffer, 1904)	X	.	.	.	.	.	.
<i>Goniozus legnieri</i> Gordh, 1982	X	.	.	.	.	.	.
<i>Goniozus pakmanus</i> Gordh, 1984	X
<i>Goniozus rugosus</i> Samad	X
<i>Goniozus similis</i> Fouts	X	.	.	.	.	.	.	.	.
<i>Heterocoelia microptera</i> (Kieffer)	X	.	.	.	.
<i>Heterocoelia prisneri</i> Moczar	X	.	.	.	.	.	.	.	.	.	.	.	.
<i>Heterocoelia syriaea</i> (Picard)	X	X	.	.	.	.	.
<i>Holepyris africanus</i> Kieffer, 1904	.	.	X	.	.	.	.	.	.	.	.	.	.
<i>Holepyris angusticollis</i> Kieffer	X	.	.
<i>Holepyris lineatus</i> Kieffer, 1906	x?	.	.	.	.	.	.
<i>Holepyris orientalis</i> Kieffer, 1906	X	.	.	.	.	.
<i>Holepyris ruficollis</i> Kieffer, 1906	X	.	.	.	.	.	X	.	.	.	.	.	.

(Eg = Egypt; Su = Sudan; Er = Eritrea; Et = Ethiopia; So = Somalia; Y = Yemen; Is = Israel; Sy = Syria; T = Turkey; Iq = Iraq; In = Iran; A = Afghanistan; P = Pakistan; x? = doubtful record)

Order Hymenoptera, family Bethylidae (Part 2)

Genus *Laelius* Ashmead

Diego N. Barbosa and Celso O. Azevedo

INTRODUCTION

The genus *Laelius* Ashmead, 1893, is represented worldwide by 30 species, 20 of them recorded from the Palaearctic region, six from the Nearctic region, two from Afrotropical region and two from the Oriental region. Ashmead (1893) described the genus as having antennae with 13 segments and a short radial vein in the fore wing. Kieffer (1905) divided *Laelius*-like species between three genera: *Laelius* Ashmead, 1893; *Allepyris* Kieffer, 1905, having tarsal claw with one apical tooth, forewing with stigma and propodeal disc with five carinae; and *Paralaelius* Kieffer, 1905, having the stigma not developed and antennae with 12 segments. Later, species of *Paralaelius* with 12 antennal segments were transferred to *Bethylus* Latreille, 1802, but consequent analysis showed large similarities with *Laelius*. Perkins (1976) synonymized *Allepyris* with *Laelius*, but did not explain this nomenclatural act and so the validity of this is doubtful, despite the remarkable similarity between these genera. Evans (1964) included *Laelius* in the Epyrini because the species of that tribe have antennae with 13 segments and the clypeal median lobe well projected forward. Most of the keys of the genera belonging to the Epyrini (Evans, 1964; Terayama, 2003; Azevedo, 2006) use the presence of a short radial vein in the fore wing as *Laelius*'s main character. However, only Evans' key uses the presence of black setae on the body surface and in the main veins of wings to separate *Laelius* from the other genera. Here *Laelius* is treated as Epyrini with thick and long setae on the body and wings surfaces, trapezoidal clypeus, without prominent lateral lobes and with median tooth, and the scutellum with four pairs of thick setae (para-sucal, post-sucal, mesal and hind setae) (Barbosa & Azevedo, 2009).

As far as we know, *Laelius* species attack larvae of some genera of Dermestidae (Evans, 1964, 1978). Abundant literature has been published on host records (e.g. Al-Kirshi et al., 1997) and on the use of *Laelius pedatus* (Say, 1836) in biological pest control (e.g. Mayhew & Heitmans, 2000).

MATERIALS AND METHODS

The material examined was provided by Antonius van Harten. If not otherwise indicated, the specimens were collected by him in the scope of the 'UAE Insect Project' and the 'Yemen Insect Inventory'. The specimens dealt with are divided between the collection of the Universidade Federal do Espírito Santo (UFES, curator: co-author), the Canadian National Collection of Insects (curator: J. Huber), and the UAE Invertebrate Collection.

Terms of body structures generally follow Evans (1964) and Azevedo (1999), the mesopleural and propodeal characters follow Barbosa & Azevedo (2009), but those related to the integument follow Harris (1979). The abbreviations used in the text are as follows: LH = length of head measured dorsally; WH = width of head measured dorsally; WF = width of frons measured dorsally; HE = height of eye measured laterally; OOL = ocelli-ocular distance; WOT = width of the ocellar triangle; DAO = diameter of anterior ocellus; VOL = vertex-ocular line measured dorsally; LFW = length of fore wing; NARC = National Avian Research Centre; MT = Malaise trap; LT = light trap; WT = water trap; AvH = A. van Harten.

The descriptions and key were elaborated with DELTA (Descriptive Language for Taxonomy) as proposed by Dallwitz et al. (1993).

SYSTEMATIC ACCOUNT

Key to the species of *Laelius* from the Arabian Peninsula

- 1 Propodeal disc with inner discal carina incomplete (Plates 5, 9); fore wing with very short radial vein $0.20\text{--}0.25 \times$ as long as basal vein (Plate 6) *Laelius brachistos* nov. spec.
- Propodeal disc with inner discal carina complete; fore wing with short radial vein $0.7\text{--}1.0 \times$ as long as basal vein (Plates 11–12) *Laelius pedatus* (Say)

Laelius brachistos Barbosa & Azevedo nov. spec.

Plates 1–11

Specimens examined: Holotype: ♀, UN[ITED] ARAB EMIRATES, SSW of ad-Dhaid, 25.09N 55.48E, 13–18.XII.2005, A. v. Harten col[lector]. In UFES. Allotype: ♂, Wadi Wurayah, 22.i.2006, WT, leg. C. Tourenq. Paratypes: 1♀, al-Ajban, 10–17.x.2005, MT & LT; 5♂, 9♀, 22.x–9.xi.2005, MT; 5♂, 2♀, 9.xi–7.xii.2005, MT & LT; 2♂, 2♀, 7–28.xii.2005, MT & LT; 2♂, 1♀, 28.xii.2005–29.i.2006, MT & LT; 1♂, 6♀, 1.iv–2.v.2006, MT; 2♂, 6–22.v.2006, LT; 3♂, 7♀, 27.v–26.vi.2006, MT & LT. 1♀, Bithnah, 19.x–16.xi.2006, MT. 6♂, Hatta, 8–26.iv.2006, LT; 33♂, 17–24.v.2006, LT; 6♂, 24–30.v.2006, LT. 4♂, near Mahafiz, 21–28.iii.2006, LT; 3♂, 24–30.v.2006, LT. 4♂, Khor al-Khwair, 2–13.v.2007, LT. 1♂, Sharjah, 27.iv–5.vi.2005, LT; 5♂, 1♀, 12–28.vi.2005, LT; 1♂, 28.vi–23.viii.2005, LT; 2♂, 24.ix–9.x.2005, LT. 1♀, Sharjah Desert Park, 25.i–22.ii.2005, LT; 1♀, 30.iv–31.v.2005, LT; 3♂, 31.v–30.vi.2005, LT; 1♀, 30.vi–21.vii.2005, LT; 2♂, 21.vii–5.viii.2005, LT; 6♂, 5–12.v.2007, LT; 9♂, 21–28.v.2007, LT; 15♂, 20.x–24.xi.2007, LT; 1♂, 21.xii.2007–23.i.2008, LT; 25♂, 30.iv–25.v.2008, LT; 11♂, 25.v–16.vi.2008, LT. 2♂, Sharjah-Khor Kalba, near tunnel, 24–30.v.2006, LT; 12♂, 31.v–17.vi.2006, LT. 9♂, Wadi Bih dam, 24.iv–1.v.2007, LT; 6♂, 9–18.vi.2008, LT. 1♀, Wadi Maidaq, 27.vi–29.vii.2006, MT; 2♂, 1–8.vii.2006, LT. 1♂, Wadi Safad, 21.ii–4.iii.2006, LT. 1♂, Wadi Shawkah, 30.vi–2.vii.2007, WT. YEMEN: 1♂, al-Kowd, i.2001, LT, leg. AvH & S. Al-Haruri. 3♀, Lahj, ix.2000, MT; 2♀, X.2000, MT; 2♀, xi.2000, MT; 3♀, i–iii.2001, MT; 1♀, 17.v–15.vi.2001, MT; 3♀, vii–ix.2001, MT; 2♀, 1.x–17.xii.2001, MT; 1♀, 17.xii.2001–31.i.2002, MT; 2♀, iii–v.2002, MT; 2♀, viii.2002, MT; all leg. AvH & A. Sallam. 1♀, 12 km NW of Manakhah, 21.viii–28.x.2002, MT.

Description of female: Holotype (Plate 1). Body 2.55 mm. LFW 1.31 mm. Colour. Head dark castaneous to nearly black; scape light castaneous; pedicel light castaneous; flagellum dark castaneous; mandible castaneous; palpi light castaneous; mesosoma dark castaneous to nearly black; tegula castaneous; wings hyaline, forewing with infuscate spot occupying part of posterior half; wing venation light castaneous; fore coxa dark castaneous nearly black; mid coxa dark castaneous; hind coxa dark castaneous nearly black; trochanters light castaneous; fore and mid femora castaneous; hind femur dark castaneous; all tibiae light castaneous; tarsi light castaneous; metasoma dark castaneous nearly black with apex dark castaneous.

Head (Plate 3). Mandible with five sharpened apical teeth, the two basal teeth wider than others, with one thick dorsal setae. Clypeus with median lobe trapezoidal with apical margin straight, longer than wide, with sharpened median teeth at apical margin. First five antennal segments in ratio of about 22:11:6:8:8. WH $1 \times$ LH. WF $1.6 \times$ HE. WF 0.56 \times WH. OOL 0.86 \times WOT. VOL 0.52 \times HE. Distance of posterior ocellus to vertex crest 0.83 \times DAO. Frons coriaceous, punctures sparse. Anterior angle of ocellar triangle 90 degrees, ocellus small, distance between inner margin of posterior ocelli about 3.0 \times DAO. Temple divergent anterad. Vertex slightly convex, corner rounded, lateral setae longer than scutellar setae.

Mesosoma. Pronotal disc coriaceous, trapezoidal, side slightly concave, punctures sparse, dorsal setae longer than scutellar setae. Mesoscutum coreaceous, with short and thick setae at

1



2



Plates 1–2. *Laelius brachistos* nov. spec. 1: Female holotype., habitus; 2: Male allotype, habitus. Scale bars 1.00 mm (Plate 1) and 0.50 mm (Plate 2).



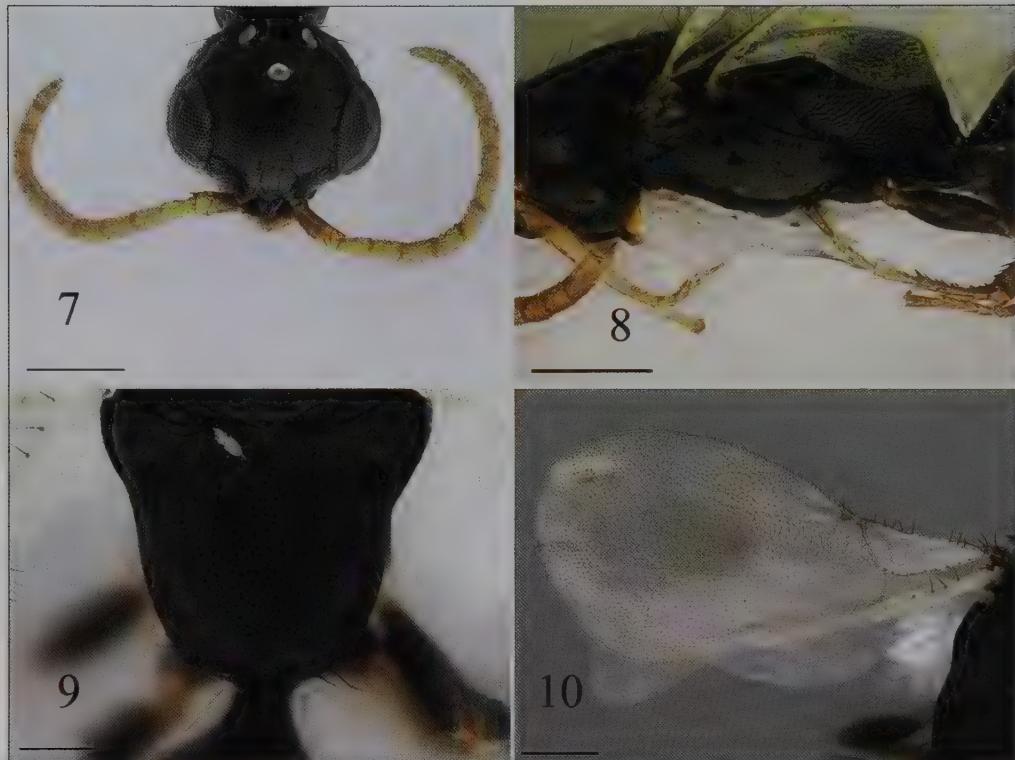
Plates 3–6. *Laelius brachistos* nov. spec., holotype. 3: Head in dorsal view; 4: Mesopleuron in lateral view; 5: Propodeum in dorsal view; 6: Forewing in dorsal view. Scale bar = 0.50 mm.

middle region. Notaulus absent. Parapsidal furrow present, inconspicuous, not reaching anterior margin of mesoscutum, parallel. Scutellum coriaceous, with post sulcal, fore, mesal and hind setae. Propodeal disc (Plate 5) as long as wide, with five carinae; median carina complete; space between median and inner discal carinae with longitudinal ridge; inner discal carinae incomplete; space between inner and second pair of discal carinae without ridge; second pair of discal carina incomplete; sublateral carina present and conspicuous; lateral carina present, followed by short striae; posterior carina complete. Declivity of propodeum striate, with median carina. Mesopleuron (Plate 4) with subtegular fovea; sub-alar fovea elongate and closed; anterior fovea closed; mesopleural fovea absent; lower fovea absent; posterior fovea absent; episternal furrow with inner margin striate.

Wings (Plate 6). Tegula with setae. Fore wing with subcostal vein with eight dorsal setae; median vein with five dorsal setae; basal vein with two dorsal setae; anal vein with four dorsal setae; stigma with one dorsal setae. Radial vein straight, $0.25 \times$ as long as basal vein. Hind wing with three hamuli.

Metasoma 2.7 times longer than wide; tergum II longer than others; terga III–VI with transverse setae line on dorsal surface; metasoma with apex acute.

Variation: Body length 2.12–2.91 mm. LFW 1.12–1.52 mm. Scape castaneous; pedicel castaneous; wing venation castaneous; tegula dark castaneous; spot of posterior half of fore wing darker or larger; fore and mid femora dark castaneous; hind femur castaneous;

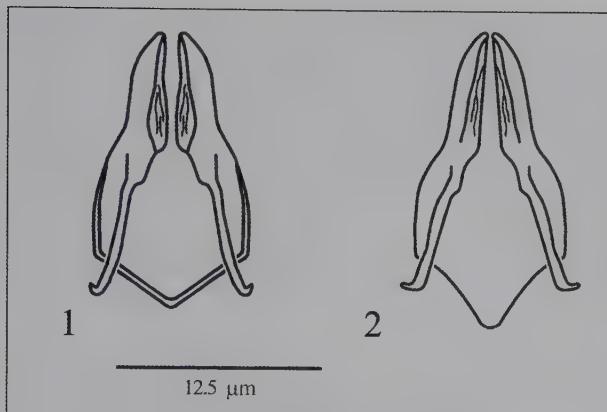


Plates 7–10. *Laelius brachistos* nov. spec., allotype. 7: Head in dorsal view; 8: Mesopleuron in lateral view; 9: Propodeum in dorsal view; 10: Wing in dorsal view. Scale bars 0.25 mm (Plates 7 and 8) and 0.50 mm (Plates 9 and 10).

metasoma dark castaneous. Mesoscutum with notaulus present but very short; parapsidal furrow conspicuous. Propodeum with longitudinal ridge between median and inner discal carina inconspicuous; sublateral carina inconspicuous. Mesopleuron with anterior fovea open; episternal furrow not striate. Fore wing with subcostal vein with nine setae.

Description of male: Allotype (Plate 2). Body 2.31 mm. LFW 1.52 mm. Colour. Head dark castaneous, nearly black; scape castaneous; pedicel light castaneous; flagellum light castaneous; mandible light castaneous with base darker; palpi light castaneous; mesosoma dark castaneous, nearly black; tegula castaneous; wings hyaline, fore wing with inconspicuous spot occupying part of posterior half; wing venation light castaneous; fore coxa dark castaneous, nearly black; mid and hind coxa dark castaneous; trochanters light castaneous; all femora dark castaneous; all tibiae light castaneous; tarsi light castaneous; metasoma dark castaneous.

Head (Plate 7). Mandible with five sharpened apical teeth, equally wide, with one thick dorsal setae. Clypeus with median lobe trapezoidal with apical margin angulate, longer than wide, with sharpened median teeth at apical margin. First five antennal segments in ratio of about 23:11:11:14:14. WH 1×LH. WF 1.21×HE. WF 0.6×WH. OOL 0.68×WOT. VOL 0.73×HE. Distance of posterior ocellus to vertex crest 0.5×DAO. Frons coriaceous, punctures sparse. Frontal angle of ocellar triangle right, ocellus large, distance between inner



Figures 1–2. *Laelius brachistos* nov. spec. Male genitalia in ventral view. 1: Allotype; 2: Paratype

margin of posterior ocelli about $1.5 \times$ DAO. Temple divergent anterad. Vertex slightly convex, corner rounded, lateral setae shorter than scutellar setae.

Mesosoma. Pronotal disc coriaceous, trapezoidal, side slightly concave, punctures sparse, dorsal setae shorter than scutellar setae. Mesoscutum coreaceous, with short and thick setae at middle region. Notaulus absent. Parapsidal furrow present, conspicuous, not reaching anterior margin of mesoscutum, parallel. Scutellum coriaceous, with post sulcal, fore, mesal and hind setae. Propodeal disc (Plate 9) as long as wide, with five carinae; median carina complete; space between median and inner discal carinae with longitudinal ridge; inner discal carinae incomplete; space between inner and second pair of discal carinae with longitudinal ridge; second pair of discal carina incomplete; sublateral carina present and inconspicuous; lateral carinae present; followed by short striae; posterior carina complete. Declivity of propodeum striate, with median carina. Mesopleuron (Plate 8) with subtegular fovea; sub-alar fovea elongate and closed; anterior fovea open; mesopleural fovea absent; lower fovea absent; posterior fovea absent; episternal furrow with inner margin striate. Wings (Plate 10). Tegula with setae. Fore wing with subcostal vein with ten dorsal setae; median vein with six dorsal setae; basal vein with two dorsal setae; anal vein with four dorsal setae; stigma with one dorsal setae. Radial vein straight, $0.2 \times$ as long as basal vein. Hind wing with three hamuli.

Metasoma $1.71 \times$ longer than wide; tergum II longer than others; terga III–VI with transverse setae line on dorsal surface; metasoma with apex acute. Genitalia (Fig. 1): Aedeagus dorsal profile bottle-shaped; constriction between basal and apical region present; apical region $0.64 \times$ longer than wide; apical lobes touching each other.

Variation: Body length 1.87–2.46 mm. LFW 1.21–1.61 mm. Scape light castaneous; fore coxa dark castaneous; femora castaneous; mid tibia light castaneous; hind tibia castaneous; metasoma castaneous. Mesoscutum with notaulus very short and broad; parapsidal furrow inconspicuous. Propodeum with median carina incomplete; without ridge between median and inner discal carina; without ridge between inner discal carina and second pair of discal carina. Mesopleuron with episternal furrow not striate. Fore wing with radial vein 0.20 – $0.25 \times$ as long as basal vein. Genitalia (Fig. 2) with apical lobes touching each other; with margin of basal region more prolongate.

Remarks: This species is similar to *L. yamatonis* (Terayama, 2006) by having the propodeal disc with five carinae, the inner discal carinae incomplete and the presence of longitudinal

ridge between median and inner discal carinae. However *L. brachistos* nov. spec. has the sublateral carinae present, the declivity of propodeum with median carina, the propodeal disc as long as wide and the radial vein very short, about $0.20\text{--}0.25 \times$ length of basal vein, whereas *L. yamatonis* has the sublateral carinae absent, the declivity of propodeum without median carina, the propodeal disc $0.83 \times$ as long as wide and the radial vein short, about length of basal vein. In fact, *L. brachistos* nov. spec. has the shortest radial vein among all species of *Laelius*.

Distribution: UAE and Yemen.

Etymology: The specific epithet *brachistos*, from Greek, refers to the very short length of radial vein in the fore wing.

Laelius pedatus (Say, 1836)

Plates 11–12

Specimens examined: Al-Ajban, 3♂, 10–17.x.2005, MT & LT; 3♂, 22.x–9.xi.2005, MT; 3♂, 3♀, 9.xi–7.xii.2005, MT & LT; 2♂, 7–28.xii.2005, MT & LT; 5♂, 28.xii.2005–29.i.2006, MT; 5♂, 5♀, 26.ii–4.iv.2006, MT; 7♂, 24♀, 1.iv–2.v.2006, MT; 9♂, 6–22.v.2006, LT; 9♂, 3♀, 27.v–26.vi.2006, LT; 14♀, 12–19.vi.2006, MT; 1♀, 26.vi–25.vii.2006, MT. N of Ajman, 1♂, 5–16.vii.2008, WT. Al-Aslab, 1♀, 19.ix.2004, at light. Bithnah, 5♂, 31.xii.2005–2.ii.2006, LT. Fujairah, 1♀, 2.v–5.vi.2005, LT; 2♂, 28.ii–1.iv.2006, LT; 1♂, 15–22.iv.2006, LT; 5♂, 20–27.v.2006, LT. Hatta, 94♂, 4♀, 8–26.iv.2006, LT; 53♂, 2♀, 17–24.v.2006, LT; 5♂, 4♀, 24–30.v.2006, LT. Khor al-Khwair, 3♂, 24.iv–1.v.2007, LT; 15♂, 2–13.v.2007, LT Near Mahafiz, 13♂, 21–28.iii.2006, LT. Sharjah, 2♂, 27.iv–5.vi.2005, LT; 1♂, 1♀, 12–28.vi.2006, LT. Sharjah Desert Park, 3♂, 25.ii–25.iii.2006, LT; 1♂, 1♀, 29.iii–6.iv.2005, LT; 2♂, 1♀, 6–30.iv.2005, LT; 5♂, 5♀, 30.iv–31.v.2005, LT; 2♂, 3♀, 31.v–30.vi.2005, LT; 2♂, 30.vi–21.vii.2005, LT; 2♂, 21.vii–5.viii.2005, LT; 2♂, 24.iii–1.v.2007, LT; 3♂, 1♀, 15–22.iv.2007, LT; 9♂, 1♀, 5–12.v.2007, LT; 10♂, 1♀, 21–28.v.2007, LT; 5♂, 20.x–24.xi.2007, LT; 1♂, 21.xii.2007–23.i.2008, LT; 62♂, 14♀, 30.iv–25.v.2008, LT; 29♂, 3♀, 25.v–16.vi.2008, LT. Sharjah-Khor Kalba, near tunnel, 27♂, 7–22.iii.2006, LT; 8♂, 24–30.v.2006, LT; 32♂, 3♀, 31.v–17.vi.2006, LT. NARC. near Sweihan, 1♂, 26.ii–2.iv.2006, LT. Wadi Bih dam, 13♂, 24.iv–1.v.2007, LT; 16♂, 7–13.v.2007, LT; 1♂, 4–9.vi.2008, LT; 4♂, 9–18.vi.2008, LT. Wadi Maidaq, 1♀, 28.xi–1.xii.2005, WT; 1♂, 4–15.ii.2006, WT; 2♂, 7–14.iii.2006, WT; 2♀, 29.iii–10.iv.2006, WT; 25♂, 27.iv–4.v.2006, WT; 1♀, 27.vi–29.vii.2006, MT; 7♂, 1–8.vii.2006, LT; 3♀, 18.xi–15.xii.2007, WT. Wadi Safad, 13♂, 20.xii.2005–2.i.2006, LT; 3♂, 31.i–21.ii.2006, LT; 23♂, 21.ii–4.iii.2006, LT; 10♂, 17–24.vi.2006, LT; 10♂, 1–8.vii.2006, LT. Wadi Shawkah, 1♀, 30.vi–2.viii.2007, WT. Wadi Wurayah, 6♂, 1♀, 12–14.iv.2005, MT & WT, leg. T. Pape; 3♂, 1♀, 22.i.2006, WT, leg. C. Tourenq. YEMEN: Al-Kadan, 1♂, x.2001, LT, leg. AvH & T. Abdul Haq. Al-Kowd, 1♂, xii.1999, LT; 1♂, ii.2000, LT; 2♂, v–vi.2000, LT; 2♂, viii.2000, LT; 1♂, x.2000, LT; 1♂, xii.2000, LT; 1♂, i.2001, LT; 18♂, vii–ix.2001, LT; 7♂, ix–xi.2001, LT; 6♂, 1♀, i–iii.2003, LT; all leg. AvH & S. Al-Haruri. Lahj, 1♀, ix.2000, MT; 1♂, x.2000, MT; 1♀, i–iii.2001, MT; 1♀, iv–v.2001, MT; 3♀, 17.iv–15.v.2001, MT; 3♀, vii–ix.2001, MT; 1♂, 17.xii.2001–31.i.2002, MT; 1♂, 4♀, iii–v.2002, MT; 1♂, viii.2002, MT; all leg. AvH & A. Sallam. 12 Km NW of Manakahah, 3♂, 2♀, 3.vii–21.viii.2001, MT; 2♂, 23.iii–5.v.2002, MT; 2♂, 4♀, 5.v–17.vi.2002, MT; 1♀, 17.vi–6.vii.2002, MT; 1♂, 2♀, 6.vii–21.viii.2002, MT; 1♀, xii.2002–v.2003, MT. Ar-Rujum, 1♀, 16.x.2000–15.i.2001, MT, leg. AvH & A. Hager. Seyun, 3♂, vi.2002, LT, leg. AvH & A. Al-Zubayri; 3♂, 12–14.viii.2002, LT, leg. AvH & G. Ba Saheh; 2♂, 20–22.viii.2002, LT, leg. AvH & G. Ba Saheh; 2♂, 4–6.ix.2002, LT, leg. AvH & A. Al-Zubaryri. Ta'izz, 1♂, x.2001, LT, leg. A. van Harten & A.R. Al-Yarimi; 2♂, v–vi.2002, LT, leg. AvH & A.R. Al-Yarimi. Zabid, 1♂, x.2001, LT.

Remarks: Say (1836) defined *Bethylus pedatus* mainly by the wing with short radial vein and body surface with scattered hairs. He did not indicate the sex in the original description. Ashmead (1893) erected the genus *Laelius* with four new species, *L. trogodermatis*, *L. tricarinatus*, *L. nigripilosus* and *L. rufipes*. He differentiated *Laelius* from *Bethylus* Latreille, 1802, because the former has antennae with 13 segments whereas the latter has antennae with 12 segments. He also differentiated *Laelius* from *Ateleopterus* Förster, 1856, mainly because of the former having the radial vein short, about as short as the basal vein, whereas

11



12



Plates 11–12. *Laelius pedatus* (Say, 1836). 11: Female, habitus; 12: Male, habitus. Scale bar = 1.00 mm.

Ateleopterus has the radial vein much longer than the basal vein. Later, *L. nigripilosus* and *L. rufipes* were synonymized with *L. tricarinatus* by Muesebeck (1939), in another work *B. pedatus* was transferred to *L. pedatus* by Muesebeck (1951), who then also synonymized *L. tricarinatus* with *L. pedatus*. At present, *L. pedatus* has five other synonyms: *Ateleopterus nubilipennis* Ashmead, 1887; *Bethylus constrictus* Ashmead, 1893; *Laelius ashmeadi* Kieffer, 1908; *Laelius fumipennis* Brues, 1910; and *Laelius foersteri* Kieffer, 1914.

The series of specimens of this species here analyzed is very large. In total there are 628 specimens, being 145 females and 391 males from the UAE, and 25 females and 67 males from Yemen. The species is recorded for the first time from the Arabian Peninsula. This increases the known distribution of the species considerably.

The large collected series of *L. pedatus* can be partly explained because sites of collection in Yemen were close to sorghum crops. According to Mayhew & Heitmans (2000), *L. pedatus* is a parasitoid of many sorghum pest, including seven species of Dermestidae (Coleoptera): *Anthrenus flavipes* Leconte, 1854; *Anthrenus sarnicus* Mroczkowski, 1963; *Anthrenus verbasci* (Linnaeus, 1767); *Trogoderma angustum* (Solier, 1849); *Trogoderma granarium* Everts, 1898; *Trogoderma glabrum* (Herbst, 1783); and *Trogoderma variabile* Ballion, 1878. This fact emphasizes the economic importance of *L. pedatus* as natural enemy of sorghum pests and stored grains. The khapra-beetle, *Trogoderma granarium*, is by far the most important pest of stored products in Yemen (Geisthardt. 1993, unpublished report).

The main variations found in this series are the angulation of frontal angle of ocellar triangle, from right-angled to slightly acute; and the thickness of mesopleural rims, the thickness of sublateral carina of the propodeal disc, and the impression of the notaulus, from moderately to strongly conspicuous.

In comparison with material from the Netherlands and Finland studied by Vikberg & Koponen (2005), the main variations found in the specimens from the Arabian Peninsula are the slightly shorter head and slightly smaller ocellar triangle. In comparison with material studied by Lanes et al. (2004) from the USA, the Arabian specimens have the radial vein more convex and with a wider apex, the basal vein less angled and the submedian cell shorter. Distribution: The Netherlands, Finland, Germany, Canada, USA, Mexico, Brazil. New to the UAE and Yemen.

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Order Hymenoptera, family Vespidae

Josef Gusenleitner

INTRODUCTION

Recently I have received from Mr. A. van Harten, Dr. M. Hauser and Dr. C. Schmid-Egger specimens of Vespidae from the United Arab Emirates for identification. The results are here reported upon.

In the last 50 years several papers about the Vespidae of the Arabian Peninsula have been published (Giordani Soika, 1959, 1979, 1980; Guichard, 1985; Gusenleitner, 2004, 2005; Richards, 1962, 1984a, 1984b). So far 20 species of Vespidae have been recorded from the United Arab Emirates (see van Harten, 2005). Here 28 further species are listed and in addition one new species of Eumeninae and three new species of Masarinae are described.

MATERIALS AND METHODS

Specimens have been collected by light traps (LT), Malaise traps (MT), water traps (WT) and by hand-collecting with a net (HC). The specimens dealt with will be deposited in the following collections: National Natural History Museum, Leiden, the Netherlands (RMNH), Biologiezentrum, Oberösterreichisches Landesmuseum Linz, Austria (OÖLM), Collection Martin Hauser, Sacramento, USA (CMH), Collection Christian Schmid-Egger, Berlin, Germany (CCSE) and the UAE Invertebrate Collection. Further abbreviations used are: AvH = leg. A. van Harten, MH = leg. M. Hauser, CSE = leg. C. Schmid-Egger. ♀ = worker.

SYSTEMATIC ACCOUNT

Subfamily Vespinae

Vespa orientalis Linnaeus, 1771

Plates 1–2

Specimens examined: Bithnah, 1♀, 31.xii.2005–2.ii.2006, LT, AvH. Hatta, 3♀, 17–24.viii.2006, LT. Sharjah-Khor Kalba, near tunnel, 2♀, 31.v–7.vi.2006, LT, AvH. Wadi Hayl; 3♀, 11–19.iii.2009, CSE. Wadi Maidaq, 1♀, 19–25.xii.2005, WT; 5♀, 27.vi–29.vii.2006, MT; 13♀, 1–8.vii.2006, LT; 1♀, 29.x–9.xi.2006, MT; 1♀, 26.x–9.xi.2006, WT; all AvH; 2♀, 11–19.iii.2009, CSE. Wadi Wurayah, 2♀, 14.xi–4.xii.2006, MT, AvH.

Diagnosis: Claws simple, not toothed. Gaster sessile, first tergite wide and with nearly vertical anterior surface. Clypeus truncate in female. Length of female ca 23 mm, worker 16–18 mm.

Distribution: The species is widespread from southern Italy and Libya in the west to India and Nepal in the east.

Subfamily Polistinae

Polistes wattii Cameron, 1900

Plates 3–6

Specimens examined: Al-Ajban, 1♀, 3♀, 29.xi–27.xii.2006, MT, AvH. N of Ajman; 2♀, 11–19.iii.2009, HC, CSE. Bithnah, 1♂, 31.xii.2005–2.ii.2006, LT, AvH. Desert Farm, 140 m, 25°08'N 55°45'E, 1♀, 2♀, 13.iii.2008, HC, MH. Jebel Hafit, 12♀, 18.iii.2009, HC, CSE. Wadi Bih (dam), 1♀, 11–19.iii.2009, HC, CSE. Wadi Maidaq, 2♀, 1–8.vii.2006, LT, AvH; 5♀, 24.ix–22.x.2006, WT, AvH; 1♀, 27.vi–29.vii.2006, MT, AvH; 1♀, 13.iii.2008, HC, MH. Wadi Shawkah, 3♀, 11–19.iii.2009, HC, CSE. Wadi



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Plates 1–2. *Vespa orientalis* Linnaeus. 1: Dorsally; 2: Laterally.



3



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Plates 3–4. *Polistes wattii* Cameron. 3: Dorsally; 4: Laterally.



5



6

Plates 5–6. *Polistes wattii* Cameron, live specimens. (Photographs by M. Hauser)

Wurayah, 8♀, 11–19.iii.2009, HC, CSE.

Diagnosis: Claws simple, not toothed. Gaster petiolate. Clypeus triangularly projecting. Gaster with bisinuous pale red-brown bands and elongate central longitudinal spot. Length 11–17 mm.

Distribution: Occurring from the Arabian Peninsula in the west to China in the east.

Subfamily Eumeninae

All species of Eumeninae have toothed claws.

Psiliglossa algeriensis E. Saunders, 1905

Plate 11

Specimens examined: Wadi Bih dam, 3♀, 11–19.iii.2009, HC, CSE. Wadi Wurayah, 1♂, 11–19.iii.2009, HC, CSE.

Diagnosis: Forewing with first recurrent nervure ending in second submarginal cell and second recurrent nervure ending in third submarginal cell. First tergite bell-shaped. Length 5–7 mm.

Distribution: This species until now was known from NW Africa and Jordan. Guichard (1985) recorded *Psiliglossa* spec. from Saudi Arabia, without identifying it to the species level. New to the UAE.

Onychopterochilus stiziformis Gусенлеитнер, 1970

Plates 7–8

Specimens examined: N of Ajman, dunes with mangroves, 1♀, 11.iii.2008, HC, MH. Sharjah Desert Park, 1♀, 19.iii.2008, HC, MH.

Diagnosis: Tegulae small and rounded, with no posterior lobe. Male with last segment of antennae in form of a spiral. Labial palpi with three segments, the second and third bordered with long bristles. Female clypeus is transverse, about twice as wide as long and rounded. Length 11 mm.

Distribution: This species was described from Iran and had not been refound since its description. New to the UAE.

Onychopterochilus fausti fausti (Morawitz, 1873)

Plates 9–10

Specimens examined: Desert Farm, 25°08'N 55°45'E, 1♂, 12.iii.2008, HC, MH. Sharjah Desert Park, 1♀, 12.iii.2008, HC, MH.

Diagnosis: Labial palpi as in *Onychopterocheilus stiziformis*, but the female clypeus is truncate and the specimens are not pale yellow and white. Length 15–20 mm.

Distribution: Described from SW Asia and already reported from the Arabian Peninsula. Also found in Kazakhstan (specimens in OÖLM). Different subspecies occur in Turkey and Israel. New to the UAE.

Alastor dalyi Giordani Soika, 1979

Plate 12

Specimens examined: Wadi Hayl, 4♂, 11–19.iii.2009, HC, CSE. Wadi Wurayah, 11♂, 4♀, 11–19.iii.2009, HC, CSE.

Diagnosis: Forewing with second submarginal cell petiolated. Length 6.5–7.5 mm.

Distribution: This species was described from Oman and was so far only known from there. New to the UAE.

Cyrtolabulus gracilis (Kohl, 1906)

Plates 13–14

Specimens examined: Jebel Hafit, 1♂, 18.iii.2009, HC, CSE. Wadi Wurayah, 1♂, 1♀, 10–26.xii.2006, WT, AvH; 4♂, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: First tergite is red, long and narrow. Apical margin of second tergite with a narrow lamella at a lower level. Postscutellum emarginate. Length 6 mm.



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Plates 7–8. *Onychopterochilus stiziformis* Gусенлеитнер. 7: Dorsally; 8: Laterally.



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Plates 9–10. *Onychopterochilus fausti fausti* (Morawitz). 9: Dorsally; 10: Laterally.



11



12

Plates 11–12. 11: *Psiliglossa algeriensis* E. Saunders; 12: *Alastor dalyi* Giordani Soika.

Distribution: Known from the Sahara und surrounding countries, the Arabian Peninsula, and Israel. Recorded from the UAE by Guichard (1985).



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14

Plates 13–14. *Cyrtolabulus gracilis* (Kohl). 13: Dorsally (photograph by C. Schmid-Egger); 14: Laterally.



Plate 15. *Labochilus pulawskyi soharensis* Giordani Soika.

***Labochilus pulawskyi soharensis* Giordani Soika, 1979**

Plate 15

Specimens examined: Wadi Bih dam, 1♀, 11–19.iii.2009, CSE.

Diagnosis: Apical margin of second tergite with a translucent lamella at a lower level. Postscutellum widely rounded. Clypeus with large and small punctuation. Labial palpi with long curved bristles. Length 6 mm.

Distribution: *Labochilus pulawskyi* Giordani Soika, 1970, was described from Egypt. The subspecies listed here has been known from Oman. New to the UAE.

***Leptodynerus arabicus* Giordani Soika, 1970**

Plates 16–17

Specimens examined: Wadi Shawkah, 310 m, 1♀, 14.iii.2008, MH.

Diagnosis: Form elongate. Seen from above, length of mesosoma much greater than twice its width at pronotum. Clypeus flattened. Length 6–7.5 mm.

Distribution: This species was described from Saudi Arabia and is also known from Israel. New to the UAE.

***Leptodynerus vanharteni* Gusenleitner nov. spec.**

Plate 18

Specimens examined: Holotype: ♀, Wadi Hayl, 25°08'N 56°21'E, 11–19.iii.2009, hand-collected, leg. C. Schmid-Egger, CCSE. Paratypes: 4♂, same data as holotype. 1♀, Jebel Hafit, 11–19.iii.2009, H.C. CSE. 2♂, Wadi Helo, 11–19.iii.2009, HC, CSE. 4♂, Wadi Maidaq, 11–19.iii.2009, HC, CSE.

Differential diagnosis: So far only two species were known of *Leptodynerus* Blüthgen, 1938. The female of the new species is most similar to *L. biskrensis* Blüthgen, 1938, especially because of the absence of clear longitudinal bands on the clypeus, a characteristic of *L. arabicus* Giordani Soika, 1970. Whereas in *L. arabicus* the whole clypeus is punctate, in the



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Plates 16–17. *Leptodynerus arabicus* Giordani Soika. 16: Dorsally; 17: Laterally.

new species the base of the clypeus is without punctures. The shiny antennal scapus is without punctuation, in both other species punctuation is present. In colouration the female of the new species is distinguishable from both other species by the white colour of spots on the dorsal parts of mesopleuron and postscutellum. In *L. biskrensis* the outer side of the tibiae are not striped as in both other species. I do not know the male of *L. biskrensis*, but the male of *L. vanharteni* nov. spec. differs from the male of *L. arabicus* by lacking white markings on tergites III–VI and additional white spots on the dorsal parts of the mesopleuron and on the postscutellum. In *L. vanharteni* nov. spec. the interspaces of punctures on the mesonotum are hardly punctate and punctuation on the mesopleura is widely spaced and very shiny. In contrast, in *L. arabicus* the interspaces of punctures on the mesonotum are densely punctulate and the mesopleuron is densely sculptured, causing a dull appearance.

Description: Female. Ground colour black, but red-coloured are major part of mandibles, apical half of clypeus, antennal scapus, narrow fringes of fern-like marking on pronotum, apical margin of postscutellum, area between postscutellum and tegulae, propodeum, legs as far as not white-coloured, first tergite with the exception of the light apical band, and first sternite. White-coloured are the base of clypeus, a broad band frontally on pronotum, intermittent by short interruptions, spots on the dorsal parts of mesopleuron, postscutellum, external stripes on tegulae, parategulae, spots on the apical end of femora I and II, outer sides of all tibiae, apical bands on tegites I and II and on sternite II. Wings are weakly grey-coloured, somewhat more expressed in the radial cell.

Face longer than broad (6.0:5.0), clypeus broader than long (2.0:1.5). Clypeus without emargination and ventrally rounded. Clypeus relatively coarsely punctate with shiny interspaces between punctures; however, its base is smooth. Clypeus with only a few off-standing setae. Antennal scapus shiny, smooth. Frons and vertex not very densely punctate, less densely so on gena, interspaces between punctures somewhat smaller than punctures and very shiny.

Pronotum not as long as in other *Leptodynerus* (length:width = 4.0:3.5). In *L. biskrensis* the margin of the pronotum is more curved vertically and the ratio length:width is 4.5:3.0. Shoulders in the new species are more strongly rounded than in *L. biskrensis*. Punctuation on pronotum stronger than on vertex. Interspaces between punctures on pronotum smaller than punctures and in some cases punctulate.

Mesonotum strongly punctate like pronotum but punctures more widely spaced. Mesopleuron much more finely punctate and punctures even more widely spaced, very shiny, posteriorly becoming dull. The oblique postscutellum with only a few punctures. Propodeum curved laterally, in the middle, directly behind postscutellum, with a perpendicular groove. The lateral sides of the propodeum very finely sculptured, with silk-like sheen. Tegulae reach somewhat further backwards than parategulae. Both without punctures and very shiny. Femora strongly shiny, sparsely punctulate. Tibiae dull, with very short light-coloured setae. Tergite I, examined from above, as long as broad, strongly curved, weakly chagrined, with some small punctures. In front of the apical band with a flat transverse groove. Tergite II evenly and finely punctate, without impressed apical band, but the margin is pale transparent, the pale apical band is grated between the large elongate depressions of the punctures. Tergites III–VI just chagrined. Sternite II, seen laterally, rather flat but convex and with a similar punctuation as tergite II. Sternites III–VI structured similarly to corresponding tergites. Frons with silvery punctuation, rather bristly, punctures smaller than diameter of one ocellus. Vertex and genae with shorter setae. A very short pubescence present on mesosoma, and especially on mesopleuron and propodeum, with a silver-like aspect. Metasoma covered with a dusty pubescence. Length 7 mm.

Male. Ground colour black, but following parts coloured red: Mandibles (partly), side of

propodeum (often unclear), inner spots on tegulae, legs until distal half of femora (often less), Tergite 1 with the exception of the light apical band, and sternite I. White-coloured are: Clypeus, the major part of antennal scapes, a broad band, in the middle straightly interrupted, frontally on pronotum, spots on the higher parts of mesopleurae, external bands on tegulae, parategulae, postscutellum, apical parts of femora, most of tibiae, metatarsi, apical bands on tergites I and II, and on sternite 2. In some paratypes central white spots occur on tergites III to VI. Clypeus as broad as long (1.8:1.8), ventrally truncate, with a few punctures on an otherwise shiny background. The antennal hook (when folded to antenna) reaches base of antennal segment XI and is small and acute. Most other characteristics as in female. Length 6–7 cm. Etymology: The species is dedicated to Mr. A. van Harten for greatly increasing the knowledge of the fauna of the UAE.

Leptochilus (Neoleptochilus) medanae falkenhayni (Dusmet, 1917)

Plate 19

Specimens examined: N. of Ajman, 1♂, 11–19.3.2009, HC, CSE. Wadi Hayl, 1♂, 11–19.3.2009, HC, CSE.

Diagnosis: Small species. Tegulae either rounded or merely angled posterior. Female clypeus apically with short carina at the lateral angles of the emargination. In profile, upper side of male antennal hook sinuate. Length 5–7 mm.

Distribution: The nominal subspecies is distributed in southern Europa and North Africa, the subspecies *falkenhayni* in the savanna and desert parts of SW Asia and North Africa, and in the Arabian Peninsula. New to the UAE.

Leptochilus (Euleptochilus) muscatensis Giordani Soika, 1979

Plates 20–21

Specimens examined: Wadi Shawkah, 310 m, 1♀, 14.iii.2008, HC, MH.

Diagnosis: The straw-coloured tegulae partly translucent, elongate and completely rounded at apex. Length 11–12 mm.

Remarks: This species is near to *Leptochilus (Euleptochilus) camurus* Giordani Soika, 1938, a species described from Egypt.

Distribution: The type locality is Muscat, Oman. New to the UAE.

Eustenancistrocerus (Eustenancistrocerus) inconstans (de Saussure, 1863)

Plate 22

Specimens examined: Jebel Hafit, 4♂, 3♀, 11–19.iii.2009, HC, CSE. Shawkah, 1♂, 11–19.iii.2009, HC, CSE.

Diagnosis: A carina at base of first tergite. Tegulae strongly punctate. Female clypeus transverse, about twice as wide as long. Metasoma partly whitish. Male antennal hook broad and truncate. Length 8 mm.

Distribution: This species ranges from north Africa, through the Arabian Peninsula and SW Asia to Iran. New to the UAE.

Antepipona arabica Giordani Soika, 1979

Plate 23

Specimens examined: Wadi Wurayah, 1♂, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: Postscutellum bidentate on either side. A smooth black shiny area with few shallow punctures on either side of propodeum. Tegulae shiny and impunctate. Length 7–8 mm.

Distribution: This species was described from Oman. New to the UAE.

Antepipona kassalensis (Giordani Soika, 1939)

Plate 24

Specimens examined: Jebel Hafit, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: Postscutellum bidentate on either side. Black and white species. Tegulae red and strongly punctate. Propodeum without a shiny area. Male antennal hook very small and obscure.



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Plates 18–19. 18: *Leptodynerus vanharteni* Gusenleitner nov. spec.; 19: *Leptochilus (Neoleptochilus) medanae falkenhayni* (Dusmet).



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Plates 20–21. *Leptochilis (Euleptochilus) muscatensis* Giordani Soika. 20: Dorsally; 21: Laterally.



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23

Plates 22–23. 22: *Eustenancistrocerus (Eustenancistrocerus) inconstans* (de Saussure); 23: *Antepipona arabica* Giordani Soika.

Length 8–10 mm.

Distribution: This species ranges from Oman over Sudan and southern Egypt westwards to Mali. New to the UAE.

Antepipona omanensis Giordani Soika, 1979

Plate 25

Specimens examined: Wadi Bih dam, 1♂, 11–19.iii.2009, HC, CSE.

Diagnosis: Postscutellum bidentate on either side. Tegulae broadly rounded. Without a black shiny area on either side of propodeum. Second tergite laterally with yellow marks. Length 7–8 mm.

Distribution: This species so far was known from Saudi Arabia and Oman. New to the UAE.

Euodynerus rufinus rufinus Blüthgen, 1942

Plates 26–27

Specimens examined: Jebel Hafit, 13♂, 11–19.i.2009, HC, CSE. Wadi Maidaq, 1♀, 13.i.2008, HC, MH; 1♂, 11–19.3.2009, HC, CSE. Wadi Shawkah, 310 m, 1♂, 1♀, 14.i.2008, HC, MH. Wadi Wurayah, 2♂, 5♀, 11–19.i.2009, HC, CSE.

Diagnosis: Posterior border of first tergum translucent. Dorsal area of postscutellum separated from posterior face by serrated edge. Upper carina of propodeum developed, more or less lamelliform. The clypeus longer than broad and coarsely punctate. Length 11–14 mm.

Distribution: This species occurs from central Asia to Israel and the Arabian Peninsula. New to the UAE.

Euodynerus salzi (Giordani Soika, 1952)

Plate 28

Specimens examined: Jebel Hafit, 5♂, 11–19.i.2009, HC, CSE. Wadi Hayl, 1♀, 11–19.i.2009, HC, CSE. Wadi Helo, 1♂, 1♀, 11–19.i.2009, HC, CSE. Wadi Wurayah, 3♂, 1♀, 11–19.i.2009, HC, CSE.

Diagnosis: Posterior border of first tergum translucent. Dorsal area of postscutellum separated from posterior face by serrated edge. Cheeks conspicuously ridged and angulated. Sides of pronotum rounded. Male antennal hook narrow and almost straight. Length 8–9 mm.

Distribution: This species occurs from Israel, across the Arabian Peninsula to Tibesti (Chad). New to the UAE.

Syneodynerus fouadi dhofarensis Giordani Soika, 1979

Plate 29

Specimens examined: Wadi Wurayah, 2♂, 3♀, 11–19.3.2009, HC, CSE.

Diagnosis: Upper carina of propodeum developed, more or less lamelliform, forming above a tooth. Posterior border of first tergum translucent. Postscutellum regularly convex. Length 9 mm.

Distribution: The holotype was described from Egypt, another subspecies from Morocco. The subspecies found in the UAE was described from Oman. New to the UAE.

Xanthodynerus octavus (Giordani Soika, 1943)

Plates 30–31

Specimens examined: Al-Ajban, 1♂, 2–11.xi.2006, MT, AvH.

Diagnosis: Posterior border of first tergite translucent. Epicnemial groove translucent lamellated. Pale yellow species. Male mid-femora angulate. Tips of antennae black. Length 8 mm.

Distribution: This species occurs in the whole of northern Africa and in the Arabian Peninsula, New to the UAE.

Knemodynerus excellens (Pérez, 1907)

Plates 32–33

Specimens examined: Wadi Hayl, 240 m, 1♂, 15.i.2008, HC, MH. Wadi Wurayah, 7♂, 1♀, 11–19.i.2009, HC, CSE.



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Plates 24–25. 24: *Antepipona kassalensis* (Giordani Soika); 25: *Antepipona omanensis* Giordani Soika.



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Plates 26–27. *Euodynerus rufinus rufinus* Blüthgen. 26: Dorsally; 27: Laterally.



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Plates 28–29. 28: *Euodynerus salzi* (Giordani Soika); 29: *Syneuodynerus fouadi dhofariensis* Giordani Soika.



Plates 30–31. *Xanthodynerus octavus* (Giordani Soika). 30: Dorsally; 31: Laterally.



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Plates 32–33. *Knemodynerus excellens* (Pérez). 32: Dorsally; 33: Laterally.

Diagnosis: Posterior border of first tergum translucent. Parategulae not visible from above. Orange-brown species. Male mid-femora simple and antennae unicolourous. Length 10–12 mm.

Distribution: This species is known from the Near East to India and from the Arabian Peninsula. Recorded from the UAE by Walker & Pittaway (1987) as *Euodynerus excellens* Pérez.

***Rhynchium oculatum adenense* Giordani Soika, 1952**

Plates 34–35

Specimens examined: Fujairah, 1♀, 28.ii–1.iv.2006, LT, AvH; 1♀, 20–27.v.2006, LT, AvH. Near Ra's al-Khaimah, 300 m, 25°48'N 56°04'E, 1♂, 16.iii.2008, HC, MH. Sharjah, 1♂, 17.iv–5.vi.2006, LT, AvH. Sharjah-Khor Kalba, near tunnel, 1♂, 17–18.iv.2006, LT, leg. M. Fibiger. Um al-Quwain, beach, 0 m, 3♂; 18.iii.2008, HC, MH. Wadi Bih dam, 5♂, 11–19.iii.2009, HC, CSE. Wadi Safad, 1♂, 14–21.v.2006, LT, AvH.

Diagnosis: Posterior part of mesonotum and scutellum smooth and shiny, almost impunctate. Female clypeus truncate at apex. Male clypeus white. Length 13–17 mm.

Distribution: The species *Rhynchium oculatum* (Fabricius, 1781), with several subspecies, occurs from the Mediterranean region to India. The subspecies *R. oculatum adenense* is known only from the Arabian Peninsula. New to the UAE.

***Rhynchium cyanopterum* de Saussure, 1852**

Plates 36–37

Specimens examined: Wadi Safad, 1♂, 14–21.v.2006, LT, AvH.

Diagnosis: Posterior part of mesonotum and scutellum smooth and shiny, almost impunctate. Female clypeus apically shallowly emarginate. Male clypeus ferruginous. Length 13–17 mm.

Distribution: The range of this species stretches from west Africa, throughout north Africa to Israel and Jordan. Also known from the Arabian Peninsula. First recorded from the UAE by Guichard (1985).

***Eumenes pomiformis* (Fabricius, 1781)**

Plate 38

Specimens examined: Wadi Wurayah, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: First tergite longer than wide in dorsal view, distinctly narrower than second tergite. This species can be easily distinguished from other species of *Eumenes* Latreille, 1802, in this geographical area by extreme short pubescence on pleuron. Apical margin of second tergite without translucent lamella, also at a lower level. Length 12–14 mm.

Distribution: This species is widely distributed in Europe, North Africa and SW Asia. As far as I know, this is the first record from the Arabian Peninsula.

***Eumenes mediterraneus* (Kriechbaumer, 1879)**

Plate 39

Specimens examined: Wadi Wurayah, 1♂, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: First tergite longer than wide in dorsal view, distinctly narrower than second tergite. Apical margin of second tergite with a translucent lamella at a lower level. Length 10–13 mm.

Distribution: This species occurs in the whole Mediterranean region, eastwards to Pakistan and central Asia. New to the UAE.

***Delta dimidiatipenne* (de Saussure, 1852)**

Plates 40–41

Specimens examined: Ra's al-Khaimah, 300 m, 1♀, 16.iii.2008, HC, MH. Wadi Bih dam, 4♂, 11–19.iii.2009, HC, CSE.

Diagnosis: First tergite long and narrow. First tergite in apical half more expanded and punctate, at least laterally. No yellow colour on second tergite. Length 20–23 mm.

Distribution: This species occurs from the Canary Islands eastwards to India. Recorded from

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Plates 34–35. *Rhynchium oculatum adenense* Giordani Soika. 34: Dorsally; 35: Laterally.



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Plates 36–37. *Rhynchium cyanopterum* de Saussure. 36: Dorsally; 37: Laterally.

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Plates 38–39. 38: *Eumenes pomiformis* (Fabricius); 39: *Eumenes mediterraneus* (Kriechbaumer).

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Plates 40–41. *Delta dimidiatipenne* (de Saussure). 40: Dorsally; 41: Laterally.

the UAE by Guichard (1985) and Gillett & Howarth (2004).

Delta esuriens esuriens (Fabricius, 1787)

Plates 42–43

Specimens examined: Near Ra's al-Khaimah, 300 m, 1♂, 16.iii.2008, HC, MH. Near Ra's al-Khaimah Airport, 1♂, 11–19.iii.2009, HC, CSE. Sharjah Desert Park, 70 m, 1♀, 12.iii.2008, HC, MH; 1♂, 11–19.iii.2009, HC, CSE. Wadi Bih dam, 3♂, 11–19.iii.2009, HC, CSE. Wadi Hayl, 1♂, 11–19.iii.2009, HC, CSE. Wadi Maidaq, 2♂, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: First tergite long and narrow. Mesonotum with red markings. Second tergite red at basis, in the middle black and a broad yellow band apically. Length 20 mm.

Distribution: The nominate form of this species occurs from India, through Iran to the Arabian Peninsula. The subspecies *Delta ersuriens gracile* de Saussure, 1852, is known from the African continent. New to the UAE.

Delta lepeleterii (de Saussure, 1852)

Plate 52

Specimens examined: Um al-Quwain, 1♂, 11–19.iii.2009, HC, CSE.

Diagnosis: First tergite long and narrow. Second tergite with a black marking in form of a cross. Pronotum yellow. Length 18–20 mm

Distribution: This species occurs from SW Asia to several parts of Africa. New to the UAE.

Delta hottentottum elegans (de Saussure, 1852)

Plates 44–45

Specimens examined: Wadi Bih dam, 1♀, 11–19.iii.2009, HC, CSE. Wadi Hayl, 3♂, 11–19.iii.2009, HC, CSE. Wadi Maidaq, 2♂, 11–19.iii.2009, HC, CSE.

Diagnosis: First tergite long and narrow, gradually expanding from base to apex, impunctate or nearly so. Brown and black species. Small yellow apical band on second tergite, sometimes absent. Length 18 mm.

Distribution: The species occurs in SW Asia, from Egypt, through the Arabian Peninsula to Iran. Recorded from the UAE by Guichard (1985).

Ischnogasteroides leptogaster leptogaster (Walker, 1871)

Plates 46–47

Specimens examined: Wadi Bih dam, 4♂, 2♀, 11–19.iii.2009, HC, CSE. Wadi Hayl, 240 m, 2♀, 15.iii.2008, HC, MH; 2♂, 1♀, 11–19.iii.2009, HC, CSE. Wadi Helo, 2♂, 11–19.iii.2009, HC, CSE. Wadi Maidaq, 2♂, 11–19.iii.2009, HC, CSE. Wadi Shawkah, 1♀, 11–19.iii.2009, HC, CSE. Wadi Wurayah, 1♂, 11–19.iii.2009, HC, CSE.

Diagnosis: First tergite very long, parallel-sided for the apical two-thirds. Tegulae ferruginous. Mesoscutum of female with two longitudinal carinae. Length 15 mm.

Distribution: Described from Arabia, this species also occurs in Israel and North Africa. New to the UAE.

Katamenes sichelii biblicus (Giordani Soika, 1935)

Plates 48–49

Specimens examined: Wadi Bih dam, 1♀, 11–19.iii.2009, HC, CSE. Wadi Maidaq, 440 m, 2♂, 13.iii.2008, HC, MH; 1♀, 15.iii.2008, HC, MH; 1♂, 11–19.iii.2009, HC, CSE. Wadi Shawkah, 310 m, 1♀, 14.iii.2008, HC, MH; 1♀, 11–19.iii.2009, HC, CSE. Wadi Wurayah, 1♂, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: First tergite long and narrow, with only short pubescence. Clypeus rounded. With yellow marks. Length 20 mm.

Distribution: This species was described from Sinai; it is known from Egypt, Israel, Jordan, and the Arabian Peninsula. New to the UAE.

Katamenes jenjouristei rubroniger (Giordani Soika, 1941)

Plates 50–51

Specimens examined: Near Ra's al-Khaimah, 300 m, 1♀, 16.iii.2008, HC, MH. Wadi Shawkah, 310 m,



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Plates 42–43. *Delta esuriens esuriens* (Fabricius). 42: Dorsally; 43: Laterally.



Plates 44–45. *Delta hottentottum elegans* (de Saussure). 44: Female; 45: Male.



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Plates 46–47. *Ischnogasteroides leptogaster leptogaster* (Walker). 46: Dorsally; 47: Laterally.



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Plates 48–49. *Katamenes sichelii biblicus* (Giordani Soika). 48: Dorsally; 49: Laterally.



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Plates 50–51. *Katamenes jenjouristei rubroniger* (Giordani Soika). 50: Dorsally; 51: Laterally.

1♂, 14.iii.2008, HC, MH.

Diagnosis: First tergite long and narrow, with only short pubescence. Clypeus rounded. No white or yellow marks. Length 15–20 mm.

Distribution: Known from Israel and the Arabia Peninsula. New to the UAE.

***Paramischocyttarus subtilis* (Magretti 1884)**

Plate 53

Specimens examined: Wadi Helo, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: Middle tibiae with two apical spurs. First tergite and basis of the second tergite very long and very narrow. Metasoma smooth. Female with last two antennal segments deformed. Length 13 mm.

Distribution: This species occurs from Israel, through the Arabian Peninsula, to east Africa south of the Sahara. New to the UAE.

Subfamily Masarinae Richards, 1962

The Masarinae are melliferous (producing honey). Species belonging to this subfamily look very different from those belonging to the Eumeninae.

***Celonites yemenensis* Giordani Soika, 1957**

Plates 54–55

Specimens examined: Wadi Bih dam, 1♀, 11–19.iii.2009, HC, CSE. Wadi Maidaq, 1♀, 29.iii–10.iv.2006, WT, AvH. Wadi Shawkah, 1♀, 19–22.v.2007, WT, AvH. Wadi Wurayah, 3♂, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: Middle of postscutellum without well-marked central raised areas except for a small central keel. Tegulae black, smooth; posterior half white and strongly punctate. Length 6 mm.

Distribution: As far as I know the nominate form of this species only occurs in the Arabian Peninsula; the subspecies *Celonites yemenensis aethiopicus* Richards, 1962, is known from Ethiopia. New to the UAE.

***Celonites jousseaumei jousseaumei* du Buysson, 1906**

Plates 56–57

Specimens examined: N of Ajman, 4♂, 2♀, 11–19.iii.2009, HC, CSE. Desert farm, 140 m, 25°08'N 55°45'E, 1♀, 12.iii.2008, HC, MH. Mahafiz, 6♀, 11–19.iii.2009, HC, CSE. Near Ra's al-Khaimah Airport, 1♀, 11–19.iii.2009, HC, CSE. Sharjah Desert Park, 70 m, 1♂, 1♀, 12.iii.2008, HC, MH; 3♂, 4♀, 11–19.iii.2009, HC, CSE. Um al-Quwain, beach, 0 m, 1♂, 18.3.2008, HC, MH. Wadi Hayl, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: Centre of postscutellum with a rather wide, shelf-like projection, which has a small central keel at mid-point. Humerus in front and mesepisternum below with strong lamellate borders. Length 5–6 mm.

Distribution: Known from Algeria to Israel, southwards to Sudan and the Arabian Peninsula. Recorded from the UAE by Richards (1984).

***Celonites pictus rufiventris* Guseinleitner, 1992**

Plate 58

Specimens examined: N of Ajman, 2♀, 11–19.iii.2009, HC, CSE.

Diagnosis: Centre of postscutellum with a strong angular projection on each side. Between these projections is on top of propodeum a smaller angular projection. Metasoma red-coloured, mesonotum black. Length 10 mm.

Distribution: This subspecies was described from Iran and occurs, according to known records, also north of the Sahara to Morocco. New to the UAE.

***Quartinia nubiana* Richards, 1962**

Plate 59

Specimens examined: Fujairah, 1♀, 6.iv–2.v.2005, LT, AvH. Near Mahafiz, 1♀, 11–19.iii.2009, HC,



Plates 52–53. 52: *Delta lepeleterii* (de Saussure); 53: *Paramischocyttarus subtilis* (Magretti).



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Plates 54–55. *Celonites yemenensis* Giordani Soika. 54: Dorsally; 55: Laterally.



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Plates 56–57. *Celonites jousseaumei jousseaumei* du Buysson. 56: Dorsally; 57: Laterally.



Plates 58–59. 58: *Celonites pictus rufiventris* Gусенлеитнер; 59: *Quartinia nubiana* Richards.

CSE. Sharjah Desert Park, 1♂, 6–28.xii.2006, LT, AvH; 6♀, 11–19.iii.2009, WT, AvH. Wadi Wurayah, 1♀, 7.iv.2006, WT, leg. C. Tourenq.

Diagnosis: Head dull, finely granulate. Mesoscutum moderately shiny, feebly reticulate with moderately strong, not very close punctures. Female has head and mesosoma black. Length 3 mm.

Distribution: This species has been recorded from Tunisia, Libya and Egypt; also recorded from the Arabian Peninsula (UAE) by Richards (1984).

***Quartinia tuareg* Giordani Soika, 1954**

Plate 60

Specimens examined: Jebel Hafit, 1♀, 11–19.iii.2009, HC, CSE.

Diagnosis: Head and mesosoma shiny. Front without punctures. Mesonotum coarsely punctate. Metasoma densely and finely punctate and yellow-coloured. Length 4 mm.

Distribution: So far this species has only been recorded from Algeria and Egypt. New to the UAE.

***Quartinia arabica* Gусенлеитнер nov. spec.**

Plates 61–63

Specimens examined: Holotype: ♀, N of Ajman, 25°26'N 55°29'E, 16.ix–12.x.2006, in water traps, leg. A. van Harten, RMNH. Paratypes: 1♀, same data as holotype. 3♂, 4♀, Wadi Wurayah, 11–19.iii.2009, WT, AvH. Wadi Maidaq, 2♂, 29.x–9.xi.2006, MT, AvH.

Differential diagnosis: There is no punctuation on head and mesosoma and consequently the new species is very similar to *Quartinia canariensis* Blüthgen, 1958, of the Canary Islands. However, in that species head and mesosoma are somewhat shinier, there are considerably more markings, the head seen frontally is substantially broader and the clypeus is white-coloured.

Description: Female. Ground colour black (on the metasoma changing to brown) with following parts white-coloured: Sides of otherwise brown labrum, underside of antennal club, with the exception of the last two segments, postscutellum, a spot at the base of fore femora, apical bands on tergites I–IV, that, however, do not stand out clearly from the brownish ground colour (on tergites II–IV in the middle weakly broadened). Median spots on tegulae, tarsi and part of tibiae light-brown. Wings completely hyaline.

Head as broad as long (3.0:3.0) (in *Q. canariensis* 3.5:3.0). The very dull clypeus as broad as long (2.5:2.5) (in *Q. canariensis* broader than long, 4.0:3.0). Eye margin broader (1:2) than in *Q. canariensis* (1:1.5). Mesonotum on anterior half in the middle with a flat longitudinal furrow that ends in an unclear dimple. Pronotum and mesopleuron basically similar to mesonotum.

Mesonotum. Horizontal parts of propodeum also similar to mesonotum, propodeum laterally elongated into a short cone. Concavity shallow and dull. Metasoma also without punctuation, but with a much finer structure than mesosoma.

The whole body with only a dusty pubescence. Length 4 mm.

Male. Ground colour of head and mesosoma black, following parts white-coloured: Underside of antennal club, with the exception of the last three segments, postscutellum. Metasoma brownish-coloured, especially on ventral side, with apical light bands on tergites I–VI. With brown median spots on tegulae, like in female,

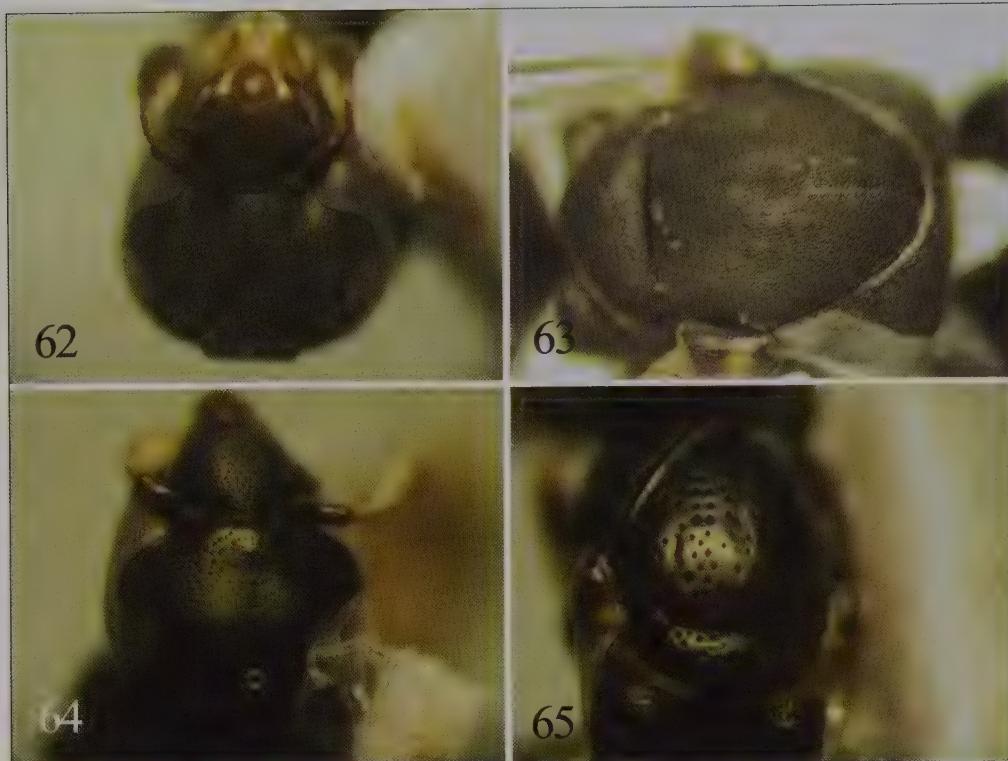
Male generally very similar to female, but tergite VII in the middle with only narrow apical band. Length 4 mm.

Etymology: Named after the region where the species was found.

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Plates 60–61. 60: *Quartinia tuareg* Giordani Soika; 61: *Quartinia arabica* Gusenleitner nov. spec.



Plates 62–65. 62–63. *Quartinia arabica* Gusenleitner nov. spec. 63: Face; 64: Mesonotum. 64–65. *Quartinia longiceps* Gusenleitner nov. spec. 65: Face; 66: Mesonotum.

Quartinia longiceps Gusenleitner nov. spec.

Specimens examined: Holotype: ♀, United Arab Emirates, Wadi Maidaq, 25°18'N 56°07'E, 26.x–9.xi.2006, in water traps, leg. A. van Harten, RMNH.

Differential diagnosis: Head in frontal view considerably longer than broad and in this aspect similar to *Quartinia halicticeps* Giordani Soika, 1939, a species that occurs from Israel through Egypt to Algeria. However, unlike that species, *Q. longiceps* nov. spec. is coarsely punctate on the mesosoma and very finely punctate on the head (very finely punctate on mesosoma and chagrined on the head in *Q. halicticeps*).

Description: Ground colour of head and mesosoma black, but following parts white-coloured: Mandibles, undersides of antennal club, anterior and posterior spots on tegulae, postscutellum, legs from distal end of femora on. On the brownish-coloured metasoma following parts are light-coloured: On tergite I a broad apical band, shortened laterally, and on tergites II–V narrow apical bands that continue laterally.

Head longer than broad (3.5:3.0) and also clypeus longer than wide (3.5:3.0). Clypeus strongly arched, coarsely chagrined and more densely punctate than at frons. In the middle the clypeus flat and emarginate. Frons and vertex shiny, finely chagrined and with wide, fine punctures; only the distal edge of the head very densely punctate.

The basic structure of the mesosomal parts is similar to that on the frons, but the general punctuation is substantially coarser than on the frons. In contrast to *Q. halicticeps*,

Plates 64–66



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Plates 67–67. 66: *Quartinia longiceps* Gусенлеitner nov. spec.; 67: *Quartinia nitens* Gусенлеitner nov. spec.



Plates 68–71. 68–69: *Quartinia nitens* Gusenleitner nov. spec. 68: Face; 69: Mesonotum. 70–71. *Quartinia haemorrhoa* Gusenleitner. 70: Face; 71: Mesonotum.

pronotum broadly rounded at shoulders.

Propodeum at horizontal areas bulgingly heightened and at the sides of the concavity with dull-edged spines. Concavity chagrined, dull. Tergites and sternites shiny, finely punctate. Body covered with a dusty pubescence, not always easily visible. Length 5 mm.
Male unknown.

Etymology: The name refers to the long head of the new species.

Quartinia nitens Gusenleitner nov. spec.

Specimens examined: Holotype: ♀, United Arab Emirates, Wadi Shawkah [Al Kahri, Shoka lake], 310 m, 25°06,41'N 56°02,6'E, 14.iii.2008, leg. M. Hauser, CMH.

Differential diagnosis: This species is very similar to *Quartinia haemorrhoa* Gusenleitner, 1997 (Plates 70–71), the females of both species having red-coloured last tergites. The new species can be distinguished by its clypeus that is more widely punctate and brilliant (more closely punctate and dull in *Q. haemorrhoa*). In addition, front and dorsal part of mesosoma are also more widely punctate and shinier, especially at frons and propodeum.

Description: The ground colour is black, but following parts are white-coloured: Basic spot of mandibles, spot at base of clypeus, underside of antennal club (upperside is light orange), two spots on the pronotum, a large spot on scutellum, tegulae (with rather hyaline medial spot), legs from apical end of femora on, apical margins of tergites I–V, in tergites II–

Plates 67–69



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Plates 72–73. *Jugurtia jemenensis* Kostylev. 72: Dorsally; 73: Laterally.

V broadening in the middle and towards the sides. Reddish-coloured, if not white, are: Mandibles, labrum, frontal edge of clypeus, tergite VI and last two sternites. The wings are completely hyaline.

Clypeus shiny and finely punctate, intermediate spaces between punctures in the middle about as large as diameter of punctures, becoming smaller towards the sides. Punctuation on frons, vertex and gena about as fine as on clypeus, but intermediate spaces considerably larger and therefore those parts strongly shiny. Pronotum, mesonotum, scutellum and horizontal parts of propodeum with considerably coarser punctuation. Mesonotum and scutellum more widely punctate than pronotum. Mesopleuron dorsally and medially more densely punctate. Ventrally mesopleuron without punctuation and very shiny (punctate in *Q. haemorrhoa*). The concavity of the propodeum is dull. Tegulae broadly rounded distally (as in *Q. haemorrhoa*). Tergites and sternites very finely punctate to chagrined, consequently appearing duller than mesosoma.

On head and mesosoma of the studied female there are no setae or other pubescence. Metasoma with a dusty pubescence. Length 4 mm.

Male unknown.

Etymology: The name refers to the strong shininess of head and mesosoma of the new species.

Jugurtia jemenensis Kostylev, 1935

Plates 72–74

Specimens examined: Jebel Hafit, 1♂, 5♀, 11–19.iii.2009, HC, CSE. Wadi Bih dam, 2♂, 11–19.iii.2009, HC, CSE. Wadi Hayl, 240 m, 1♂, 15.iii.2008, HC, MH; 5♂, 11–19.iii.2009, HC, CSE. Wadi Maidaq, 2♂, 11–19.iii.2009, HC, CSE. Wadi Shawkah, 310 m, 16♂, 9♀, 14.iii.2008, HC, MH; 7♀, 11–19.iii.2009, HC, CSE. Wadi Wurayah, 1♂, 2♀, 11–19.3.2009, HC, CSE.

Diagnosis: Elongated species. Hind coxa with an inner dorsal keel. Wings not longitudinally folded. Length 8–9 mm.

Distribution: This species occurs from Morocco to Israel and the Arabian Peninsula. Recorded from the UAE by Richards (1984).

DISCUSSION

In this contribution 42 species of Vespidae are listed. The following eight species recorded from the UAE by Guichard (1985) were not collected during the present survey: *Allodynerus dignotus* (Morawitz, 1895), *Allodynerus vinciguerrae* (Guiglia, 1929), *Chlorydynerus chloroticus* (Spinola, 1838), *Chloridonerus kelidopterus* (Kohl, 1907), *Delta campaniforme gracile* (de Saussure, 1852), *Euodynerus niloticus ebneri* (Schulthess, 1921), *Pseudepipona nekt* (Giordani Soika, 1943) and *Tachyancistrocerus quabosi* Giordani Soika, 1979. In addition, Gusenleitner (1994) listed one other species not now listed: *Euodynerus setosus rubicundus* Gusenleitner, 1994, and Richards (1984b) yet another one: *Polistes indicus* Stolfa, 1934. That brings the total number of Vespidae now known in the UAE to 52. It is clear that the fauna of the country is much larger and it is hoped that future collecting will yield many further species.

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Plate 74. *Jugurtia jemenensis* Kostylev. (Photograph by M. Hauser).

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Order Hymenoptera, family Mutillidae

Subfamilies Ticoplinae and Dasylabrinae

Arkady S. Lelej and Antonius van Harten

INTRODUCTION

Mutillidae are ectoparasitoid wasps commonly referred to as ‘velvet ants’ because of the appearance of the dense hair that covers their bodies. Females are entirely wingless, while males are normally fully winged. The females are known for their extremely painful sting. They invade the nests of wasps and bees and lay eggs near the larvae and pupae. Mutillidae, with about 4200 described species, occur worldwide but mainly in the tropics. They are especially common in desert and sandy areas.

The United Arab Emirates are located in the eastern part of the Arabian Peninsula south and north of the Tropic of Cancer between Persian Gulf and the Gulf of Oman. Most part of this country is occupied by the great desert Rub-al-Khali. Up to now, the mutillid fauna of the UAE was unknown; solely the family Mutillidae (without identified taxa) was recorded from this country by Tigar & Osborne (1999). The mutillid fauna of neighboring Iran numbers 78 species in 22 genera (Lelej, 2002; Lelej & Osten, 2004; Lelej et al., 2008). Forty species in 19 genera occur in Yemen (Lelej & van Harten, 2006) and only four species are known from Oman and seven species from Saudi Arabia. During 2005–2009, A. van Harten collected several thousands of specimens of Mutillidae in different sites of the UAE using different kinds of traps (van Harten, 2008). The light traps were most successful for the collecting of mutillids, because the velvet ants are mainly nocturnal and crepuscular in the arid areas. We expect that the number of mutillid species in the UAE will be no less than that in Yemen, another country of Arabian Peninsula. The study of the material is continuing and here the first part of our research, covering the subfamilies Ticoplinae and Dasylabrinae, is presented. Two new species are described, three known species are listed as well as five species that are probably new and will be described elsewhere in the near future.

MATERIALS AND METHODS

This paper is based mainly on material collected in United Arab Emirates by A. van Harten with traps (mostly light traps, Malaise traps, water traps) during recent years (2005–2009). This material comprises several thousand mutillid specimens. Never before has such rich material of Arabian Mutillidae been available for study. We also studied 48 specimens collected by T. Osten in 2003 in the neighbouring Oman [deposited in SMNS]. For the identification of material we used the collections of Palaearctic Mutillidae housed in the Institute of Biology and Soil Science, Vladivostok, Russia (IBSS) and the Zoological Institute, St. Petersburg, Russia (ZIN). Valuable exchange material of Afrotropical Mutillidae has been received by the senior author from Denis Brothers (University of KwaZulu-Natal, Pietermaritzburg, South Africa), and the late Guido Nonveiller.

Specimens were borrowed from or will be deposited in the following collections: IBSS, ZIN, Museo Civico di Storia Naturale di Milano, Italy, National Museum of Natural History, Leiden, the Netherlands (RMNH), Staatliches Museum für Naturkunde in Stuttgart, Germany (SMNS), and the United Arab Emirates Invertebrate Collection. During a trip to South Africa (University of KwaZulu-Natal, Pietermaritzburg) in 2008, the senior author was able to study

the vast material (including many types) used by D.J. Brothers and P.S. Bayliss for their revision of the genus *Tricholabiodes*.

The following abbreviations have been used in the text: T1, T2, T3, etc., to denote the first, second, third, etc., metasomal terga, and S1, S2, S3, etc., to denote the first, second, third, etc., metasomal sterna; POD, to denote the postocellar (interocellar) distance between posterior ocelli which is measured from above, and OOD, to denote the ocellocular distance between posterior ocellus and compound eye which is measured from above; LT – light trap; MT – Malaise trap; PT – pitfall trap; WT – water trap; AvH – A. van Harten; NARC – National Avian Research Centre.

SYSTEMATIC ACCOUNT

Subfamily **Ticoplinae** Nagy, 1970

Tribe **Ticoplini** Nagy, 1970

Genus ***Nanomutilla*** André, 1900

The taxonomic history of *Nanomutilla* is discussed by Mitchell & Brothers (2002). Currently, this genus includes many species from southern Palaearctic and Afrotropical Regions, most of them being as yet undescribed. We accept here Mitchell & Brothers' concept of *Nanomutilla*. The senior author discussed with D. Brothers the systematic position of *Nanomutilla wurayahensis* nov. spec. described below.

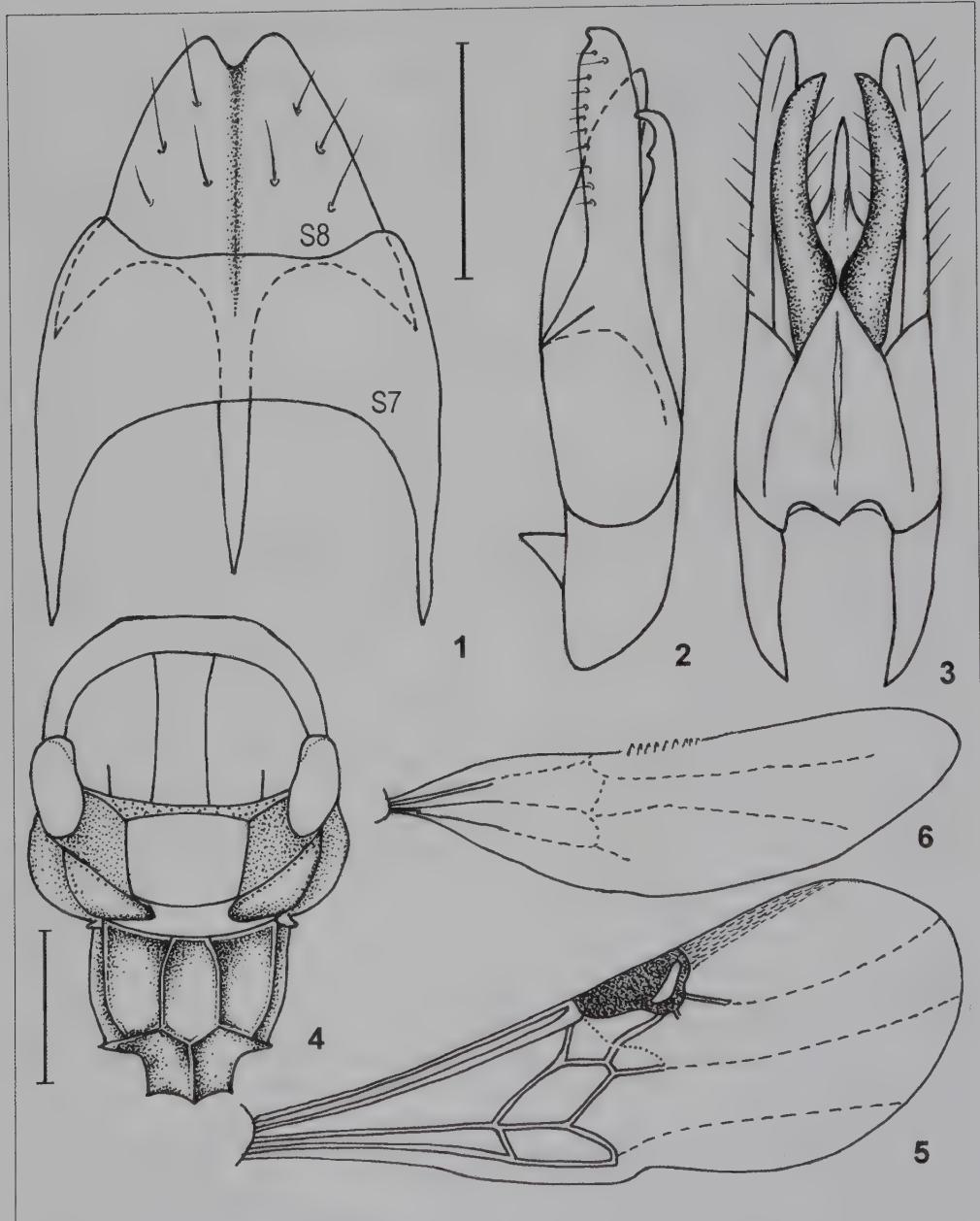
***Nanomutilla wurayahensis* Lelej nov. spec.**

Plate 1, Figures 1–5

Specimens examined: Holotype: ♂, United Arab Emirates: Wadi Wurayah, 25°24'N 56°17'E, 12–14.iv.2005, in Malaise trap and water traps, leg. A. van Harten [RMNH]. Paratypes: 1♂ with the same label as holotype [IBSS]. 1♂, Wadi Maidaq, 26.xi.2005–2.i.2006, WT, leg. AvH.

Diagnosis: Superficially *Nanomutilla wurayahensis* nov. spec. even resembles the male of *Heterogyna nocticola* Ohl, 2006 (family Heterogynaidae) recently described from Oman (Ohl & Bleidorn, 2006) and recorded from the UAE (Ohl, 2008) by fore wing venation and by the colouration of antennae and legs, but differs by having quite another shape of pronotum, hypopygium (S8), and genitalia. In the male the new species differs greatly from both species of *Nanomutilla* described from Jordan [*N. yoca* (Nagy, 1970) and *N. parila* (Nagy, 1970)] by having more developed fore and hind wing venation (strongly reduced in both mentioned species), by having elongate tegula (small rounded in both mentioned species), and by having notauli and basal part of parapsids (lacking in both mentioned species). *Nanomutilla wurayahensis* nov. spec. is most similar to undescribed species from Kenya and Jordan (D. Brothers, pers. comm.).

Description: Male. Body length 3.6–4.8 mm. Head. 1.16× as wide as long, 0.91× as wide as mesosoma, sparsely pubescent. Antennal tubercles separate, not joined by a straight transverse ridge. Scape ventrally with strong lateral and weak mesal carina. Frons and vertex finely and sparsely punctate, interspaces of about several puncture diameters; vertex along eye posterior border weakly striate. Eye inner margin shallowly emarginate at mid height. Eye entirely pubescent, pubescence visible at small magnification. Ocellar triangle weakly protuberant, ratio POD:OOD 1.0. Malar space 0.13× eye height. Clypeus with median area delimited by weak ridges. Mandible with larger apical and smaller middle and basal inner tooth, with weak subbasal tubercle beneath. First flagellomere 0.61× as long as second flagellomere; flagellomere 2 twice as long as wide.



Figures 1–5. *Nanomutilla wurayahensis* Lelej nov. spec., male. 1: S7 and S8, ventral view; 2: Genitalia, lateral view; 3: Genitalia, ventral view; 4: Mesosoma, dorsal view; 5: Fore wing; 6: Hind wing. Scale-line for Figs 1–3 – 0.25 mm, for Fig. 4 – 0.5 mm.



Plate 1. *Nanomutilla wurayahensis* Lelej nov. spec., male, habitus.

Mesosoma as in Figure 2, $1.54 \times$ as long as wide, excluding anterior collar. Dorsal and anterior faces of pronotum smoothly merging, without transverse carina. Pronotum sparsely punctate dorsally, interspaces of about several puncture diameters; humeral angle abruptly obtuse; antero-dorsal margin straightish. Mesoscutum as densely punctate as pronotum, scutellum more finely punctate than pronotum; long setae on posterior and lateral margins of scutellum. Notaulus well developed and deep, reaching posterior margin of mesoscutum; weakly developed, anteriorly convergent parapsidal line reaching level of anterior margin of tegula. Scutellum weakly convex, flattened posteriorly, sides convergent posteriorly, posterior margin not lamellate, abutting metanotum.

Tegula elongate, ratio of tegula length to mesoscutum length 0.66, posteriorly even protruding over level of posterior margin of scutum; anteriorly with oblique line of dense punctures delimiting small shiny impunctate area; densely punctate along inner border; with sparse setae, disc shiny impunctate without setae. Metanotal dorsellum flattened, finely and densely punctate laterally. Propodeum widest anteriorly. Disc and declivity of propodeum distinct. Propodeal disc at least $1.5 \times$ as long as declivity height, with three very large central and two lateral fields defined by well developed carinae. Propodeal declivity with two large fields defined by well developed carinae except posterior border. Lateral surface of pronotum with sparse fine punctures. Mesopleuron coarsely and densely punctate, interspaces less than puncture diameter, disc sparsely punctate, interspaces of about three puncture diameter or more, weakly convex and sparsely punctate ventrally. Metapleuron and lateral surface of propodeum densely punctate. Fore wing with venation distally of radial (marginal) cell

nebulous to spectral, weak and almost indistinguishable. Hind tibia with longer spur, $0.54 \times$ as long as first tarsomere.

Metasoma. Felt line on S2 and T2 absent. S2 with short median longitudinal basal carina. Hypopygium apical margin notched mesally. Sparse, shallow punctuation dorsally, interspaces $2-4 \times$ puncture diameter. T1 $0.71 \times$ as long as T2, T2 $0.84 \times$ as long as wide. T7 dorsally flattened, sparsely punctate. S1 coarsely punctate with straight median longitudinal carina. Genitalia as in Figures 2 and 3. Penis valve more than $0.75 \times$ as long as gonostyle; gonostyle almost straight; volsella with setae ventrally, not brush-like, ventrally slightly curved; penis valve with two teeth apicoventrally.

Colour. Black, but tegula pale translucent over posterior third, mandible yellowish-brown with brown apex; antenna dark brown with yellow scape and pedicel; legs yellow with brown apical portion of femora; tibial spurs yellowish, wings hyaline, pterostigma and marginal cell dark brown, other venation brown to pale-brown. Semi-erect pubescence of body predominantly whitish, sparse apical fringe of white setae on T1-T6 and S2-S6.

Female. Unknown.

Distribution: UAE.

Etymology: The specific name originates from Wadi Wurayah, the type locality, a large canyon system in the mountainous area on the east side of the UAE. Since April 2009 Wadi Wurayah has been a fully protected area.

Subfamily **Dasylabrinae** Invrea, 1964

Genus **Tricholabiodes** Radoszkowski, 1885

The species of this genus are nocturnal and widespread in arid areas of the Palaearctic and Afrotropical regions, a few penetrate to the Oriental region. Most of the species are known from males, a few from females and five (*Tricolabiodes asiaticus* Radoszkowski, 1885, *T. nursei* Lelej, 1995, *T. thisbe* (Péringuay, 1898), *T. lividus* André, 1909 and *T. tharensis* Lelej, 1995) are known from both sexes.

We recognized in the UAE six species represented by males and three species represented by females. The descriptions of four new species represented by males are to appear in a monograph on *Tricholabiodes* (Brothers & Bayliss, in prep.) and we enumerate them as species 1-4. Furthermore, the senior author informed D. Brothers about how our species numbers correspond to their new species, so that they can be included in the paratype series. Of three species represented by females (from the *semistriatus* species-group) one probably is the opposite sex of a new species being described by Brothers & Bayliss (in prep.). We enumerate this female species as *Tricholabiodes* spec. 5.

Tricholabiodes aegyptiacus (Radoszkowski, 1876)

Plates 2-3

Specimens examined: Sharjah Desert Park, 1♀, 30.iv.-25.v.2008, LT, leg. AvH. Um al-Quwain, 4♀, 1-30.xi.2008, PT, leg. AvH.

Distribution: Egypt. New to the UAE.

Tricholabiodes arabicus Suárez, 1967

Plate 4

Specimens examined: N of Ajman, 1♂, 25.v.-12.vi.2008, WT, leg. AvH; 12♂, 26.v.-5.vii.2008, WT, leg. AvH; 20♂, 5-16.vii.2008, WT, leg. AvH; 15♂, 16-19.vii.2008, WT, leg. AvH; 10♂, 10-14.viii.2008, leg. AvH. SSW of ad-Dhaid, 5♂, 23.iv.2005, at light, leg. AvH & K. Szpila. Um al-Quwain, 1♂, 27-29.x.2008, PT, leg. AvH. Wadi Bih dam, 10♂, 13-21.iv.2008, LT, leg. AvH; 20♂, 21-30.iv.2008, LT, leg. AvH; 18♂, 30.iv.-4.vi.2008, LT, leg. AvH; 9♂, 4-9.vi.2008, LT, leg. AvH; 4♂, 9-18.vi.2008, LT, leg. AvH; 15♂, 18-24.vi.2008, LT, leg. AvH; 9♂, 24-29.vi.2008, LT, leg. AvH; 5♂, 29.vi-8.vii.2008,



1.00 mm



1.00 mm

Plates 2–3. *Tricholabiodes aegyptiacus* (Radoszkowski), female, habitus. 2: Dorsal view; 3: Lateral view.



Plates 4: *Tricholabiodes arabicus* Suárez, male, habitus.

LT, leg. AvH; 12♂, 9–23.vii.2008, LT, leg. AvH. OMAN: 10 km S of al-Qabil, sandy desert, 5♂, 8.xii.2003, LT, leg. T. Osten [SMNS].

Distribution: Oman, Yemen (Suárez & Nonveiller, 1990). New to the UAE.

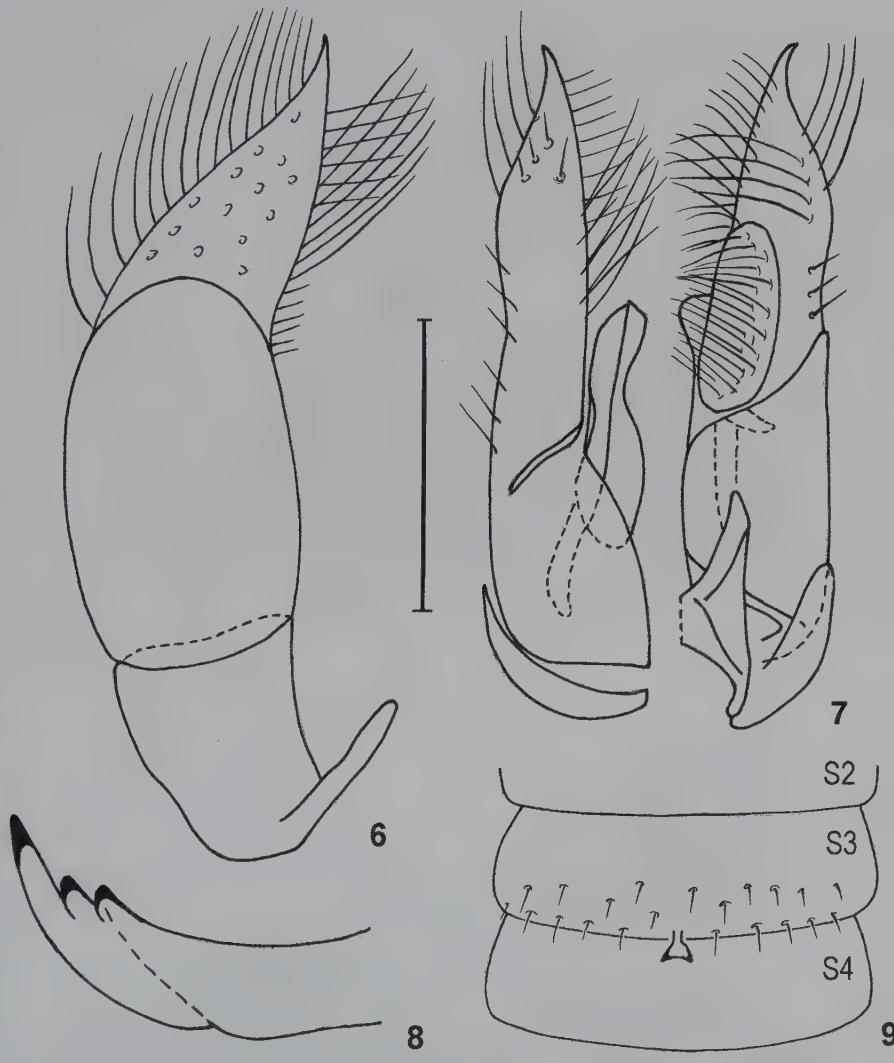
***Tricholabiodes brothersi* Lelej nov. spec.**

Plates 5–6, Figures 6–9

Specimens examined: Holotype: ♂, United Arab Emirates, al-Ajban, 24°36'N, 55°01'E, 19–26.v.2006, in Malaise trap, leg. A. van Harten [RMNH]. Paratypes: 1♂ with the same data as holotype [IBSS]. 9♂, SSW of ad-Dhaid, 23.iv.2005, at light, leg. AvH & K. Szpila. 1♂, Sharjah, 6–30.vi.2005, LT, leg. AvH. 1♂, NARC, near Sweihan, 2–30.iv.2005, LT, leg. AvH.

Diagnosis: The male of the new species differs from other *Tricholabiodes* species, including the new ones being described by Brothers & Bayliss (in prep.), by having a posteromesal bifurcal process on S3 (Fig. 9) and by having a very small quadrangular 2r-m cell (larger and quinqueangular in other species).

Description: Male. Body length 5.6–8.4 mm. Free border of clypeus entirely convex, without a protuberance on either side of midline, without vestiture clumped. Mandible compressed tridentate, mesal margin smooth; dorsal rim of mandible carinate, without an enlarged vertical flange (Fig. 8); subbasal ventral tooth not dilated. Anterior surface of scape with one longitudinal carina. Anteromesal surface of mesosternum simple, without mesosternal process on either side of midline. Posterior mesal margin of metacoxa without a tuft of setae. Metacoxa without any trace of longitudinal carina along mesal margin, ventral surface of coxa strongly convex. Mesotibia oval in cross-section. Ventral surface of metafemur without clumping of macrosetae, macrosetae shorter than shorter tibial spur. Anterior one-third of T2 moderately and mediumly punctate. Mesobasitarsus almost imperceptibly curved in lateral view. Ratio POD:OOD 1.3. Diameter of anterior ocellus 1.35 × distance between it and



Figures 6–9. *Tricholabiodes brothersi* Lelej nov. spec., male. 6: Genitalia, lateral view; 7: Genitalia (left – dorsal view, right – ventral view); 8: Mandible; 9: S3 and S4, ventral view. Scale-line for Figs 6, 7 – 0.5 mm.

posterior ocellus. Head with sides behind eyes strongly convergent with straight posterior margin (dorsal view). Antennal scrobe with well-developed dorsal tubercle. Frons and vertex matt, microgranulate. Pronotum and mesopleuron reticulate. Mesoscutum with complete notaui and traced parapsids. Mesoscutum with dense medium punctation. Mesoscutellum with smaller puncture. Propodeum gently sloping, laterally and dorsally reticulate. Parascutal carina well developed, ending by tooth. Metasomal segment 1 petiolate, T1 $1.65 \times$ its maximal width. T2 with long lateral felt line, S2 without any traces of felt line. Disc of S2 not



Plates 5–6: *Tricholabiodes brothersi* Lelej nov. spec., male, habitus.

flattened. S3 with posteromesal bifurcal process (Fig. 9). T7 except basal part microgranulate, basal part elevated with rough foveae. Genitalia as in Figures 6 and 7. Colour. Antennal palps and legs even whitish-yellow, other body parts straw-coloured. Mandibular teeth reddish-brown. Wings hyaline, fore wings distally of cells slightly infuscated. Body and legs clothed with subappressed short and scattered long erect whitish setae. Felt line on T2 whitish.

Female. Unknown.

Distribution: UAE.

Etymology: This species is dedicated to Denis J. Brothers, world authority on Mutillidae and Aculeate classification and evolution.

***Tricholabiodes craspedopygius* Suárez, 1967**

Plates 7–8

Specimens examined: Sharjah, 1♀, 10.xi.2004, LT, leg. AvH. Sharjah Desert Park, 3♀, 6–28.xii.2006, PT, leg. AvH; 10♀, 20–26.x.2008, PT, leg. AvH; 12♀, 1–30.xi.2008, PT, leg. AvH. Um al-Quwain, 4♀, 1–30.xi.2008, PT, leg. AvH.

Distribution: Eritrea. New to the UAE.

***Tricholabiodes* spec. 1**

Specimens examined: Al-Ajban, 5♂, 19–26.v.2006, MT, leg. AvH; 4♂, 27.v–26.vi.2006, MT, leg. AvH. SSW of ad-Dhaid, 13♂, 23.iv.2005, at light, leg. AvH & K. Szpila. Sharjah, 1♂, 31.v–12.vi.2005, LT, leg. AvH. NARC near Sweihan, 6♂, 14.iii–2.iv.2005, LT, leg. AvH; 25♂, 2–30.iv.2005, LT, leg. AvH; 13♂, 30.iv–11.v.2005, LT, leg. AvH.

***Tricholabiodes* spec. 2**

Specimens examined: Al-Ajban, 13♂, 19–26.v.2006, MT, leg. AvH; 4♂, 27.v–26.vi.2006, MT, leg. AvH; 2♂, 17.x–19.xi.2005, LT, leg. AvH. N of Ajman, 1♂, 5–16.vii.2008, WT, leg. AvH. SSW of ad-Dhaid, 13♂, 23.iv.2005, at light, leg. AvH & K. Szpila. Sharjah, 2♂, 10.xi.2004, LT, leg. AvH; 1♂, 6–30.vi.2005, LT, leg. AvH. Sharjah Desert Park, 4♂, 30.iv–31.v.2005, LT; 3♂, 7–16.v.2006, LT; 1♂, 5–12.v.2007, LT; 1♂, 21–28.v.2007, LT; 1♂, 6–30.iv.2008, LT; 7♂, 30.iv–25.v.2008, LT; 3♂, 16.vi–17.vii.2008, LT; 1♂, 17–24.vii.2008, LT; 1♂, 24.vii–14.viii.2008, LT; 3♂, 1–30.xi.2008, LT; all leg. AvH. NARC near Sweihan, 1♂, 14.iii–2.iv.2005, LT, leg. AvH; 6♂, 2–30.iv.2005, LT, leg. AvH; 1♂, 30.iv–11.v.2005, LT, leg. AvH.

***Tricholabiodes* spec. 3**

Specimens examined: Al-Ajban, 5♂, 17.x–19.xi.2005, LT, leg. AvH; 13♂, 19–26.v.2006, MT, leg. AvH; 9♂, 27.v–26.vi.2006, MT, leg. AvH. N of Ajman, 2♂, 10–14.viii.2008, WT, leg. AvH. SSW of ad-Dhaid, 16♂, 23.iv.2005, at light, leg. AvH & K. Szpila. Near Mahafiz, 6♂, 2–14.ix.2006, LT, leg. AvH. Sharjah, 2♂, 6–30.vi.2005, LT, leg. AvH. Sharjah Desert Park, 1♂, 30.iv–31.v.2005, LT; 3♂, 7–16.v.2005, LT; 3♂, 30.vi–9.vii.2005, LT; 1♂, 5–12.v.2007, LT; 2♂, 21–28.v.2007, LT; 2♂, 4–9.vi.2007, LT; 1♂, 6–30.iv.2008, LT; 10♂, 30.iv–25.v.2008, LT; 2♂, 25.v–16.vi.2008, LT; 21♂, 16.vi–17.vii.2008, LT; 3♂, 17–24.vii.2008, LT; 3♂, 24.vii–14.viii.2008, LT; 1♂, 9.viii–4.ix.2008, LT; all leg. AvH.

***Tricholabiodes* spec. 4**

Specimens examined: Fujairah, 1♂, 6.iv–2.v.2005, LT, leg. AvH. Hatta, 6♂, 8–26.iv.2006, LT, leg. AvH. Sharjah-Khor Kalba, near tunnel, 1♂, 26.iv–3.v.2006, LT, leg. AvH; 9♂, 23–30.vi.2006, LT, leg. AvH; 5♂, 31.v–7.vi.2006, LT, leg. AvH. Wadi Bih dam, 8♂, 13–21.iv.2008, LT; 11♂, 21–30.iv.2008, LT; 32♂, 30.iv–4.vi.2008, LT; 7♂, 4–9.vi.2008, LT; 39♂, 18–24.vi.2008, LT; 15♂, 24–29.vi.2008, LT; 12♂, 29.vi–8.vii.2008, LT; 75♂, 9–23.vii.2008, LT; all leg. AvH. Wadi Maidaq, 460 m, 1♂, 12.iv.2006, at light, leg. C. Gielis; 15♂, 27.iv–4.v.2006, at light, leg. C. Gielis; 10♂, 1–8.vii.2006, LT, leg. AvH. Wadi Safad, 6♂, 14–21.v.2006, LT, leg. AvH. OMAN: 10 km S of Nizwar, Wadi al-Ghul, 500 m, 14♂, 10–11.xii.2003, LT, leg. T. Osten [SMNS].



1.00 mm



1.00 mm

Plates 7–8. *Tricholabiodes craspedopygus* Suárez, female, habitus. 6: Dorsal view; 7: Lateral view.

***Tricholabiodes* spec. 5**

Specimens examined: Sharjah Desert Park, 1♀, 30.iv–25.v.2008, LT, leg. AvH. Wadi Bih dam, 1♀, 4–9.vi.2008, LT; 1♀, 18–24.vi.2008, LT; 1♀, 29.vi–8.vii.2008, LT; 1♀, 9–23.vii.2008, LT; all leg. AvH.

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Order Hymenoptera, family Sapygidae

Christian Schmid-Egger

INTRODUCTION

The small family Sapygidae includes about 30 species in the Palaearctic region (Kurzenko & Gusenleitner, 1994). Specimens measure between 6–22 mm and can be recognized easily in the field by the elongate shape of the combined with their black and yellow (or black reddish) body colour and by a clubiform antennae. Females of Sapygidae lay eggs into the nests of solitary bees, mostly of the family Megachilidae, and the developing larvae consume both the host larvae and the supply of food provided for them. The palaearctic species are keyed by Kurzenko & Gusenleitner (1994). Gusenleitner (1996, 1997) describes additional species.

MATERIALS AND METHODS

This chapter is based on material collected by the author during a visit to Sharjah in March 2009 for the UAE Insect Project. The systematic account follows that of Kurzenko & Gusenleitner (1994). The material is deposited in the collection of the author.

SYSTEMATIC ACCOUNT

Asmisapyga guichardi Gusenleitner, 1996

Specimens examined: Jebel Hafit, S of al-Ain, 1♀, 18.iii.2009, leg. C. Schmid-Egger. Wadi Wurayah 1♂, 17.iii.2009, leg. C. Schmid-Egger.

Remarks: The specimens from UAE agree in morphologically with specimens from Morocco and Israel, but differ in colour. The female from the UAE has the body whitish-yellow, the clypeus predominantly yellow with a large black basal spot, the tergum II with a lateral spot and in general the pale colour is more extended than in females from Morocco. A female examined from Israel represents an intermediate form; it has the clypeus with a small apical reddish band, pale parts of the head and the mesosoma are yellowish-reddish, the colour of the metasoma is pale white-yellowish. The male from the UAE (compared with a male from Morocco representing the typical form) has the clypeus and a large area above it completely white-yellowish (the clypeus black and the area above it with a small reddish band in the male from Morocco), the pronotum with a large pale band (with a narrow and darker band), the terga II and V with lateral spots, the terga III–VI with large white-yellowish band (the terga III–IV with a lemon yellow band and remaining terga black). In addition, the punctuation of the upper part of the head and the middle part of the pronotum is much sparser and includes larger shiny interspaces in the male from the UAE compared to the male from Morocco.

Ecology: The specimens were collected by hand-netting on flowering *Ochradeanus aucheri* (Resedaceae).

Distribution: Morocco (Gusenleitner, 1996), Egypt (Gusenleitner, 1997), Israel (Iddan, 38°49'N 35°17'E), 1♀, 31.iii.1995, leg. M. Irwin, coll. CSE). New to the UAE.



Plates 1–3. *Asmisapyga guichardi* Guseinleitner. 1: Habitus; 2: Head of female; 3: Head of male.

Key to the species of *Asmisapyga* Kurzenko, 1994.

The genus *Asmisapyga* is characterized by a large inpunctate and shiny lateral area on the propodeum. This area is lacking in *Sapyga* and in other Palaearctic genera. Two species have been described in *Asmisapyga*, which can be recognized as follows (key for males and females):

- 1 Flagellomere I 1.3–1.5 times as long as its apical width, shorter than scape. Mesothorax and propodeum black. Terga III–IV with a yellow band, terga II and V black or with lateral spots. Terga with scattered and weak punctures, interspaces 0.5–1.0 times of punctures. Anterior edge of pronotum rounded. Smaller species, 6–8 mm. [Morocco, Egypt, Israel, UAE] *Asmisapyga guichardi* Gusenleitner, 1996
- Flagellomere I twice as long as its apical width and as long as scape. Mesothorax and propodeum with yellow spots. All terga with reddish or yellow bands or spots. Terga densely and distinctly punctate. Anterior edge of pronotum right-angled or with a small carina. Larger species, 9–11 mm. [Turkey, Syria, Israel, Jordan, Tunisia (in Tunisia subspec. *rubescens* Gusenleitner, 1996, with distinctly red colour)] *Asmisapyga warnckeii* Kurzenko, 1994

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Order Hymenoptera, family Halictidae

Supplementary records of the genus *Sphecodes* Latreille

Maximilian Schwarz

INTRODUCTION

In the first comprehensive paper on the bees of the United Arab Emirates (Dathe, 2009) some 45 species of Halictidae were mentioned, among them two known species of the genus *Sphecodes* Latreille, 1804, as well as another species tentatively identified. It was mentioned that a new species of the genus would be described in the near future. That species is now described here and in the meantime also some further specimens of *Sphecodes* from the UAE have become available, one other species new to science and three species not before recorded from the country. This material was obtained from the Klaus Warncke Collection, Biologiezentrum des Oberösterreichischen Landesmuseums in Linz, Austria, and from Prof. Dr. H.H. Dathe (Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany).

MATERIALS AND METHODS

The holotype of *Sphecodes dathei* nov. spec. will be deposited in the collection of the Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (SDEI), and that of *Sphecodes villosulus* nov. spec. in the collection of the USDA-ARS Bee Biology & Systematics Laboratory, Utah State University, Logan, USA. The other specimens will be in the private collection of the author, Ansfelden, Austria, in the United Arab Emirates Invertebrate Collection, and in the SDEI.

The photographs were made with a Pentax Optio 30.

SYSTEMATIC ACCOUNT

Sphecodes dathei Schwarz nov. spec.

Plates 1–12

Specimens examined: Holotype: ♀, United Arab Emirates, Wadi Shawkah, 25°06'N, 56°02'E, 9–24.vi.2007, in water trap, leg. A. van Harten, coll. SDEI. Paratypes: 8♀, same data as holotype; 5♀, same locality but 30.vi–2.vii.2007, in water traps, leg. A. van Harten.

Description: Female. Head transverse oval, eyes clearly converging below (Plate 1). Clypeus slightly arched with coarse, sparse punctures with broad, smooth interspaces (Plate 2). Shape of labrum as in Plate 3. Mandibles with inner tooth, long and thin (Plate 4). Frons relatively densely punctured but with clear, if narrow, smooth interspaces and frontal carina running from supraclypeal field as a fine ridge nearly to the anterior ocellus (Plate 5). Postocellar area narrow, about twice as broad as the diameter of a posterior ocellus, space between ocellus and compound eye very sparsely and finely punctured (Plate 6).

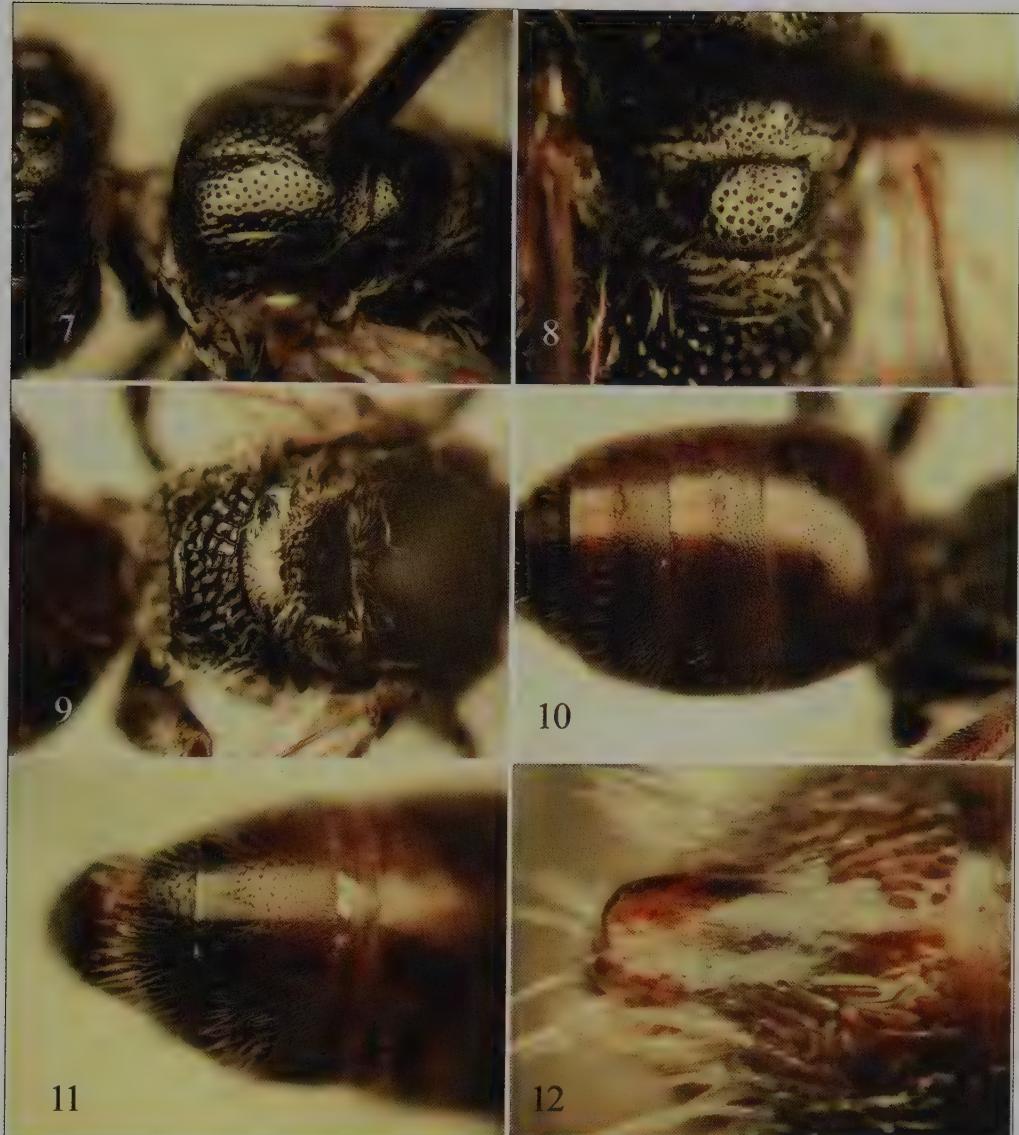
Mesonotum with clear but widely spaced punctures and broad, smooth interspaces several times the width of a puncture. Middle of mesonotum with a clear longitudinal impression, reaching to half the length of mesonotum; the parapsidal furrows clearly developed (Fig. 7). Scutellum partly somewhat more coarsely punctured than the mesonotum (Fig. 8). Sculpture of propodeum coarse and sharp-edged (Plate 9). Pleura and sternum coarsely wrinkled, matt. Terga 1–4 with broad, mirror-smooth apical depressions, separated from the relatively densely punctured basal areas by several rows of coarser punctures (Plate 10 (T1–3) and



Plates 1–6. *Sphecodes dathei* nov. spec., female, paratype. 1: Shape of head; 2: Punctuation of clypeus; 3: Form of labrum; 4: Right mandible; 5: Frons with carina; 6: Vertex, between ocellus and compound eye.

Plate 11 (T4–5)). Pygidial field broad, the apical half with a weak spoon-shaped depression, very finely shagreen, strongly shining (Plate 12).

Head with exception of clypeus, upper frons and postocellar area with relatively short, but dense and white and more appressed pubescence. Pronotum and postscutellum densely and appressed, pleura and sternum with longer, erect, sparse white pubescence. Legs with erect, sparse pubescence, relatively long on the hind tibiae and tarsi. Hindwing with 5 hamuli.



Plates 7–12. *Sphecodes dathei* nov. spec., female, paratype. 7: Sculpture of mesonotum; 8: Punctuation of scutellum; 9: Sculpture of propodeum; 10: Sculpture of terga 1–3; 11: Sculpture of terga 4–5; 12: Pygidial field.

Head, thorax and all femora black; abdomen red, tergum 5 darkened. Mandibles basally dirty yellow, towards apices becoming dark brown. Labrum dirty yellow, the basal protuberance brownish. Scape black, antennae reddish brown, somewhat darkened above. Tibiae and tarsi reddish yellow, with partly extensive darkening.

Length: 5.5–6.0 mm.

Male unknown.

Etymology: This species is named in honour of Prof. Dr. H.H. Dathe, Müncheberg, Germany, for his permanent helpfulness.

***Sphecodes marginatus* Hagens, 1882**

Specimens examined: Dubai, Nakhalai, 1♂, 2–8.iv.1984, in Malaise trap, leg. E. Sugden.

Distribution: Central Europe north till 55°N, from Atlantic east till W Ukraine, with subspecies occurring in Canary Islands, North Africa and Crete. New to the UAE.

***Sphecodes olivieri* Lepeletier, 1825**

Specimens examined: Dubai, al-Awir, 8♂, 3♀, 30.iv.1984; 2♂, 2–5.v.1984; 2♂, 5–7.v.1984; 4♂, 1♀, 12–16.v.1984; 2♂, 1♀, 17–21.v.1984; 6♂, 22–26.v.1984; all in Malaise trap, leg. E. Sugden. Dubai, Nakhalai, 1♂, 28–31.iii.1984; 2♂, 15–18.iv.1984; 2♂, 21–25.iv.1984; 2♀, 25–28.iv.1984; all in Malaise trap, leg. E Sugden.

Distribution: Occurring in South Europe, North Africa, Israel, Caucasus and further eastwards in Asia. New to the UAE.

***Sphecodes pinguiculus* Pérez, 1903**

Plate 13

Specimens examined: Dubai, al-Awir, 20♂, 6♀, 30.iv.1984; 2♂, 2–5.v.1984; 1♂, 12–16.v.1984; 1♂, 22–26.v.1984; 1♂, 26–30.v.1984; all in Malaise trap, leg. E Sugden. Dubai, Nakhalai, 6♂, 15–18.iv.1984; 24♂, 4♀, 21–25.iv.1984; 11♂, 1♀, 25–28.iv.1984; 3♂, 1♀, 28–30.iv.1984; all in Malaise trap, leg. E Sugden.

Distribution: Canary Islands, South Europe, North Africa, Israel, Turkey, Turkmenistan and Tajikistan. New to the UAE.

***Sphecodes villosulus* Schwarz nov. spec.**

Plates 14–36

Specimens examined: Holotype: ♀, United Arab Emirates, Dubai, Nakhalai, 28–30.iv.1984, in Malaise trap, leg. E. Sugden, in coll. USDA-ARS Bee Biology & Systematics Laboratory, Utah State University, Logan, USA. Paratypes: 2♂, 3♀, same collecting data; 2♂, 1♀, same locality but 28–31.iii.1984; 9♂, 15–18.iv.1984; 14♂, 5♀, 21–25.iv.1984; 8♂, 25–28.iv.1984. Dubai, al-Awir, 1♂, 2♀, 30.iv.–2.v.1984; 4♂, 1♀, 2–5.v.1984; 3♀, 5–7.v.1984; 2♂, 3♀, 12–16.v.1984; 10♂, 3♀, 17–21.v.1984; 1♀, 22–26.v.1984; 1♂, 2♀, 26–30.v.1984. All Malaise trap, leg. E. Sugden.

Description: Female. Head transverse oval, the eyes weakly converging below (Plate 14). Clypeus evenly punctured with narrow interspaces (Plate 15). Labrum semicircular, smooth and shining without longitudinal impression or apical emargination (Plate 16). Mandibles long and thin without inner tooth, similar to *S. armeniacus* Warncke, 1992 (Plate 17). Frons with fine and relatively widely spaced punctures, the smooth interspaces partly reaching twice the diameter of a puncture (Plate 18). Vertex between ocellus and compound eye with very widely spaced, fine punctures (Plate 19). Frontal keel fine, but clearly developed and reaching to middle of frons (Plate 20). Vertex between hind ocelli and preoccipital ridge narrow, fine and widely spaced punctured. (Plate 21). Mesonotum with very fine and widely spaced punctures, the median impression, though clear, cannot be described as conspicuous, the parapsidal furrows relatively long and distinctly developed (Plate 22). Scutellum with regular and widely spaced punctures. Propodeum reticulately wrinkled, the lateral fields with sharp margins (Plate 23). Tergum 1 with few, very fine punctures and without clear rows of punctures anterior to apical depression (Plate 24). Terga 2–4 with fine punctuation, reaching to the broad, smooth depressions (Plate 25). Tergum 5 with noticeably coarser punctuation (Plate 26). Pygidial field broad, the apical margins turned somewhat upwards, smooth and strongly shining (Plate 27). Pleura and sternum wrinkled-reticulate, matt.



Plates 13–18. 13: *Sphecodes pinguiculus* Pérez, male, genitalia. 14–18: *Sphecodes villosulus* nov. spec., female, paratype. 14: Shape of head; 15: Form and punctuation of clypeus; 16: Labrum and sculpture of the clypeus; 17: Right mandible; 18: Punctuation of frons.

Head, including clypeus and nearly to anterior ocellus with dense, and relatively appressed white pubescence. Pronotum, postscutellum and the pleura with more or less dense, white pubescence. Legs with pale hairs, pubescence of hind tibiae noticeably longer.

Hindwings with 5 hamuli.

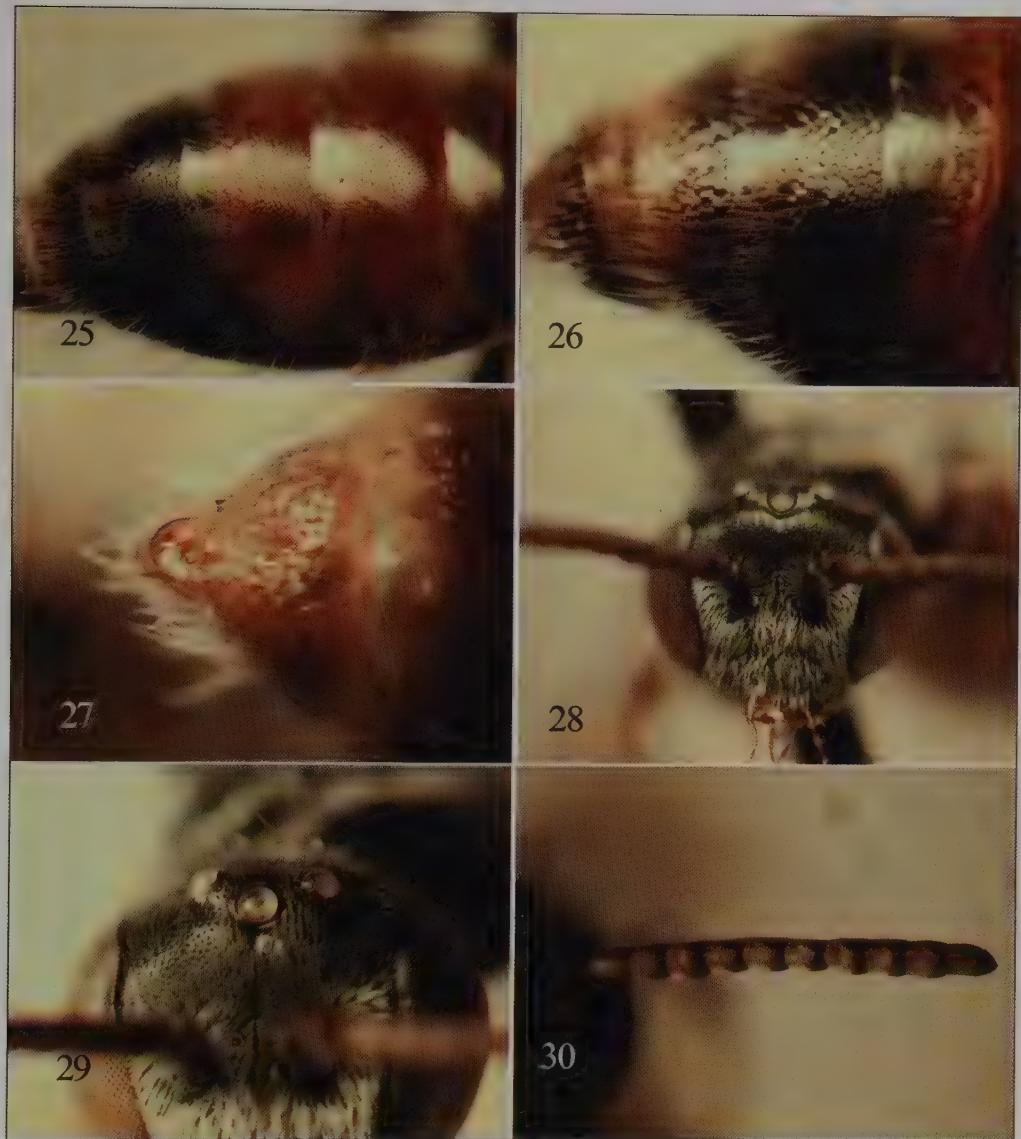
Head and thorax black, abdomen red, Terga 4–6 more or less blackened. Basal half of



Plates 19–24. *Sphecodes villosulus* nov. spec., female, paratype. 19: Punctuation of vertex between ocellus and compound eye; 20: Frontal carina; 21: Sculpture of vertex behind ocelli; 22: Sculpture of mesonotum; 23: Structure of propodeum; 24: Punctuation of tergum 1.

mandibles yellow, the apical third rust red. Labrum brownish, the basal protuberances yellow-red. Scape black, flagellum rust red, with upper surface slightly darkened. Calli reddish yellow, tegulae transparent. All femora black, tibiae and tarsi yellow-red, the tibiae more or less suffusedly brown.

Length: 5 mm.



Plates 25–30. 25–27. *Sphecodes villosulus* nov. spec., female, paratype. 25: Punctuation of terga 2–4; 26: Punctuation of tergum 5; 27: Shape of pygidium. 28–30. *Sphecodes villosulus* nov. spec., male, paratype. 28: Shape of head; 29: Pubescence of frons and vertex; 30: Shape of antenna.

Male. Head nearly circular in outline, with relatively dense, somewhat erect white pubescence (Plate 28), which only on the area of upper frons and post-ocellar area is more upright, less conspicuous and does not hide the sculpture (Plate 29).

Antennae short, antennomeres 5–13 on the basal half with short, dense pubescence, apical half with ball-shaped projection (Plate 30). Mesonotum very similar to female (Plate 31).



Plates 31–36. *Sphecodes villosulus* nov. spec., male, paratype. 31: Sculpture of mesonotum; 32: Sculpture of propodeum; 33: Sculpture of terga 1–4; 34: Depression on gonocoxites; 35: Structure of gonostyli; 36 structure of tergum 7.

Propodeum in general sculptured as in female (Plate 32). Tergum 1 on the disc with few, fine punctures, Terga 1–4 with fine punctuation reaching to the depressions (Plate 33). Genitalia similarly formed to *S. pinguiculus* Pérez, the basal pits of the gonocoxites only shallowly developed (Plate 34), the gonostyli very short in comparison to *S. pinguiculus* Pérez (Plate 35). Plate 13 shows the genitalia of *Sphecodes pinguiculus* Pérez for comparison. Pubescence in general as in female, inconspicuous.

Head black, mandibles yellowish, flagellum brownish red with slightly darkened upperside. Thorax black, calli yellowish, tegulae transparent, as in female. Abdomen reddish with extensive darkened areas, such as tergum 1 up to apical depression and tergum 3 on apical half up to depression brownish. Terga 4–6 blackish, tergum 7 brown-red, on the base with coarse punctuation and broad, rounded off and smooth apical half (Plate 36). The colouration of abdomen variable, so that individuals occur, in which abdomen is rather uniformly brownish to nearly red. Femora as a rule black, the tibiae and tarsi yellowish with larger or smaller dark markings. Length 3.5–5.0 mm.

Biology: This newly described species is very probably a parasite of *Lasioglossum (Evylaeus) villosulum* (Kirby, 1802) [thanks for the determination of the species in 1992 are due to P.A.W. Ebmer, 1992].

Etymology: This species is named after its host, *Lasioglossum (Evylaeus) villosulum* (Kirby, 1802).

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Order Lepidoptera, family Nepticulidae

Erik J. van Nieukerken

INTRODUCTION

The Nepticulidae are a family of about 800 named species of very small moths (wingspan less than 10 mm), of which the larvae make leaf-mines, stem-mines or rarely galls. The family is poorly known from the desert regions in Northern Africa and the Middle East, but relatively well known from Central Asian deserts (Turkmenistan, Uzbekistan, Mongolia), thanks to the work of R. Puplesis and students (summarised in Puplesis, 1994). The family was previously hardly known from the Arabian Peninsula, except for four species, recently described from northern Oman (Puplesis & Diškus, 2003). Here the family is recorded for the first time from the UAE, with seven species, two in *Stigmella* Schrank, 1802, and five in *Acalyptis* Meyrick, 1921, of which one is described as new. Except for *S. birgittae* Gustafsson, 1985, these species are also new for the Arabian Peninsula. Because some of the recorded species are actually rather common and widespread in the desert regions of North Africa and Asia, but virtually unknown in the literature, several unpublished records and synonymies of these species are presented here and they are redescribed. In this way the family Nepticulidae is not only recorded for the first time from the UAE, but also from Libya, Sudan, Egypt, Saudi Arabia and Pakistan.

Stigmella omani Puplesis & Diškus, 2003, is synonymised with *S. birgittae* Gustafsson, 1985, *S. ziziphivora* Gustafsson, 1985, is synonymised with *S. zizyphi* Walsingham, 1911. The latter does not occur in the UAE, but is compared with the closely related *S. birgittae*. *Nepticula liochalca* Meyrick, 1916, and *N. homophaea* Meyrick, 1918, are both synonymised with *Stigmella xystodes* (Meyrick, 1916), all three described from India; this species is here reported new for many countries in the North-African-Asian warm eremic region.

In *Acalyptis*, *A. Iovovskyi* (Puplesis, 1984) is synonymised with the type species *A. psammophrica* Meyrick, 1921. *Acalyptis gielisi* is described as new; it is very close to the South African *A. lanneivora* (Vári, 1955). From a fifth species of *Acalyptis*, only one female has been collected. It is described, but not named here.

The seven recorded species probably only represent a small portion of the actual fauna, which could best be studied additionally by searching for stem- and leaf-mines on potential hostplants. The genera *Trifurcula* Zeller, 1848, and *Ectoedemia* Busck, 1907, are also likely to occur here.

DNA sequences of several specimens were used in addition to morphological characters for decisions on species identities, in particular for associating males and females. The results of the barcoding gene CO1 are discussed at the end of this chapter.

MATERIALS AND METHODS

Specimens from the UAE are partially deposited in the collection of the National Museum of natural History, Naturalis, in Leiden, The Netherlands and partially in the United Arab Emirates Invertebrate Collection. For other specimens cited, I use the name of the city of the museum as indication for the repository, rather than the cumbersome codens. Full data can be found in Evenhuis & Samuelson (2004). Dry pinned specimens were collected by J. Buszko and C. Gielis at light, except some specimens of *S. birgittae*, reared by C. Gielis. Alcohol-preserved specimens were collected in light traps by A. van Harten. Abbreviations and

number in square brackets after the number of males and females refer to genitalia slide numbers. Genitalia slide numbers have a direct relation to RMNH registry numbers, also used for DNA vouchers: RMNH.INS number = EJvN slide + 20,000. VU numbers (used up to number 2000) are equal to EJvN numbers.

Information on names and distribution of (potential) hostplants has been taken from Jongbloed (2003). Methods for preparation of genitalia, photographs of adults and genitalia and measurements follow those described in van Nieukerken (2007). Distribution maps were made with DMAP (Morton, 2000), locality coordinates, where not known, were searched with Google Earth.

Molecular methods are similar to those described in van Nieukerken (2007). DNA was extracted solely from abdomens, at the same time as genitalia preparation (protocol according to Knölke et al., 2005). The voucher data and references to sequences in BOLD and Genbank numbers are given in Table 1, and will be open access upon publication of this paper.

Phylogenetic methods follow the same paper, and the *Acalyptris* sequence data therein are also used in the analyses here, seen the predominance of that genus. As outgroup the sequences of the two *Tischeria* specimens treated in the following chapter (van Nieukerken, 2010) are also included.

SYSTEMATIC ACCOUNT

Genus *Stigmella* Schrank, 1802

Stigmella species are usually easily recognised by the collar, comprising lamellar scales, whereas these scales are piliform in most Nepticulidae, except in the Holarctic *Bohemannia* Stainton, 1859, and some tropical *Acalyptris*.

Currently *Stigmella* represents the largest genus of Nepticulidae with more than 350 named species, occurring worldwide. The genus is especially common in forested areas, and much less diverse in desert and steppe habitats. Of the two species treated here, *S. birgittae* belongs to the *paliurella* species group (all feeding on Rhamnaceae) and *S. xystodes* to an Asian-Australian group of monocot feeders (Poaceae, Cyperaceae), including *S. opismeniella* Kemperman & Wilkinson, 1985 (Kemperman et al., 1985) from Japan, feeding on the grass *Oplismenus*. This group also has similarities to the Holarctic *S. betulicola* group, and several other tropical *Stigmella*.

Stigmella birgittae Gustafsson, 1985

Plates 1, 2, 5–9, 16, 17

Stigmella birgittae Gustafsson, 1985: 171 – Holotype ♂ GAMBIA: Kotu stream, 15.xi.1981, leaf-mines on *Ziziphus mauritiana*, e.l. 27.xi.1981, B. Gustafsson, genitalia slide RM6713 (Stockholm) [examined].

Stigmella omani Puplesis & Diškus, 2003: 207 – Holotype ♂ OMAN, Northern region, Jabal Shams, 1100 m, 7.i.1993, B. Skule, genitalia slide Pupl017 (Copenhagen) [examined] nov. syn.

Specimens examined: UAE: Sharjah, 1♂, 2♀ [ethanol material], 1.i–10.ii.2005, in light trap, A. van Harten; 1♂, 1♀ [gen. preps. EJvN3731, 3865], larvae, leaf-mines, 2–19.ii.2006, mines on *Ziziphus spina-christi*, e.l. 3–20.iii.2006, leg. C. Gielis; 1♀ [EJvN3862], 1.iii.2006, leg. C. Gielis; 1♂, 21.iv.2006, leg. C. Gielis; Sharjah Desert Park, 4♂, 3♀ [ethanol material], 18.i–22.ii.2005, in light trap, leg. A. van Harten. Wadi Maidaq, 460 m, 1♂ [EJvN3864], 6.iv.2006, leg. J. Buszko.

Other material: SAUDI ARABIA: Riyadh, 2♂, 1♀, 5.iii.1985, reared from leaf-mines on *Ziziphus*, leg. Talhoek (Leiden).

Diagnosis: Separated from the much larger *Stigmella xystodes* by the dark head in combination with irrorate wings, whereas *xystodes* has uniform grey to brown wings. As *Stigmella* it differs from the other UAE Nepticulidae with similar external features by the collar with lamellar scales; the others have piliform scales. *Stigmella zizyphi* Walsingham,



Plates 1–4. *Stigmella*, adults. 1: *S. birgittae*, ♂, Wadi Maidaq, EJvN3864; 2: *S. birgittae*, ♀, Sharjah, EJvN3865; 3: *S. xystodes* ♂, Wadi Maidaq, EJvN3860; 4: *S. xystodes* ♂, Sudan, EJvN0435. Scale lines 1 mm.

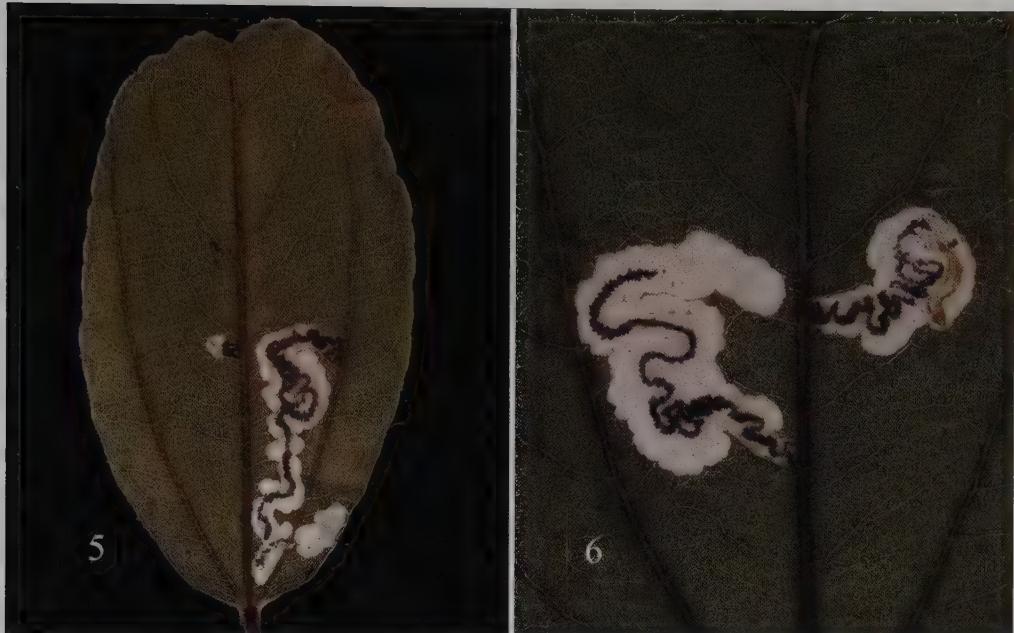
1911, is a very similar species on the same host genus, which might be expected here. It has fewer cornuti (up to 4) than *S. birgittae* and a less indented uncus (Plate 10, see also Gustafsson, 1985, for more differences).

Redescription: Male. Forewing length 1.6–1.8 mm, wingspan 3.6–4.1 mm. Head: frontal tuft fuscous, mixed with paler scales, ochreous on frons, collar yellowish white. Scape yellowish white with some dark scales. Antenna ochreous, with 24–34 segments. Thorax and forewing ochreous, irrorate with brown scales; terminal cilia ochreous. Hindwing paler. Abdomen ochreous, no visible anal tufts, vestiture on valvae concolorous. Underside abdomen and legs white.

Female. Forewing length 1.8–1.9 mm. Antenna with 21–23 segments. Otherwise as male.

Male genitalia. Capsule length 180–210 µm (n=5), about as long as wide. Vinculum anteriorly slightly excavated; uncus strongly bilobed, with V-shaped indentation. Gnathos with widely separate long posterior processes and short but distinct anterior processes. Valva 155–160 µm (n=5), more or less triangular, tip acute, but not curved inwards; along inner margin an inwardly curved lobe below apex; transtilla long, sublateral processes curved, less than half transtilla length. Aedeagus length 155–180 µm (n=5), anteriorly truncate, posteriorly rounded; cathrema large, vesica with 6–7 long spinelike cornuti, all arranged on a row, with apex towards posterior opening.

Female genitalia. Total length ca 730 µm. T8 broadly rounded, with scattered setae and scales, a concentration of ca. 10 setae apically; anal papillae indistinct, without setae.



Plates 5–6. *Stigmella birgittae*, leaf-mines in *Ziziphus spina-christi* from Sharjah. Scale lines 5mm (5), 2mm (6).

Posterior apophyses narrow, longer than anterior ones. Bursa without accessory sac, elongate, covered with minute wart-like sclerotizations, slightly larger ones forming a distinct narrow band across bursa of ca 400 µm long.

Biology: Hostplants are *Ziziphus mauritiana* and *Z. spina-christi*. The latter is common and widespread in the Haggar mountains (Jongbloed, 2003), elsewhere in the UAE planted.

Leaf-mine. Egg on upper surface, usually against midrib or a lateral vein. Mine a gallery, frequently forming a small blotch through coalescence of the windings; frass in narrow central line. Larva yellowish green, vacating mine through slit in upper surface. Larva described in detail by Gustafsson (1985). Mine separated from that of *S. zizyphi* by the exit slit: upperside in *S. birgittae*, underside in *S. zizyphi*. The frequent mines of *Bucculatrix* on the same host are very narrow galleries, ending in a relative long and narrow final part without frass.

Remarks: *Stigmella omani* is synonymised here, since the studied holotypes do not show real differences (Plates 8, 9). The differences listed by Puplesis & Diškus (2003) are to be considered as artefacts due to the different slide mounting of both types (much squashed in *S. birgittae*). Now that it is shown that the Arabian populations also feed on the same host genus, there is little reason to maintain two species.

S. ziziphivora Gustafsson, 1985 is synonymised with the closely related *S. zizyphi* (Walsingham, 1911) after comparing types of both species (see Plate 10) (**nov. syn.**).

Labels male holotype *Nepticula zizyphi*: “Beni Mora, Biskra, ALGERIA, Zizyphus 16.II ex. 21.III.1903 Wlsm. 96915” / “Walsingham Collection 1910–427”/ plus type labels (London). From *Stigmella ziziphivora* several paratypes and holotype were studied (GAMBIA: Bakau, Kotu stream, 7–13.xii.1982, emerged 16.xii.1982–3.i.1983, leg. Gustafsson; Stockholm).

Only two other specimens have been seen, both from Algeria: one female plus mine reared by Chrétien from Biskra (Paris) and one male reared by Walsingham from Hammam-es-Salahin, (London).

Distribution (Map 1): *S. birgittae* is probably widespread in the Arabian Peninsula and North Africa, recorded from Gambia, Oman and here newly recorded for Saudi Arabia and the UAE.

***Stigmella xystodes* (Meyrick, 1916)**

Plates 3, 4, 11–15, 18, 19

Nepticula xystodes Meyrick, 1916: 6 – Lectotype ♂ [here designated], INDIA: Pusa, Bengal [now Pūsa, Bihar], 2.viii.[19]11, TB F[fletcher], Genitalia slide BM24106 (London) [examined].

Nepticula liochalca Meyrick, 1916: 6 – Holotype ♀, INDIA: Pusa, Bengal [now Pūsa, Bihar], bred vii.[19]08, TB F[fletcher], Genitalia slide BM28327 (London) [examined] nov. syn.

Nepticula homophaea Meyrick, 1918: 181 – Holotype ♀, INDIA: Dharwar, Kanara [now Dhārwād, Karnataka], 3.vii.[19]08, RM[axwell], Genitalia slide BM28326 (London) [examined] nov. syn.

Specimens examined: UAE: Wadi Midaq, 460 m, 1♂ [EJvN3860], 16.iv.2006, leg. C. Gielis.

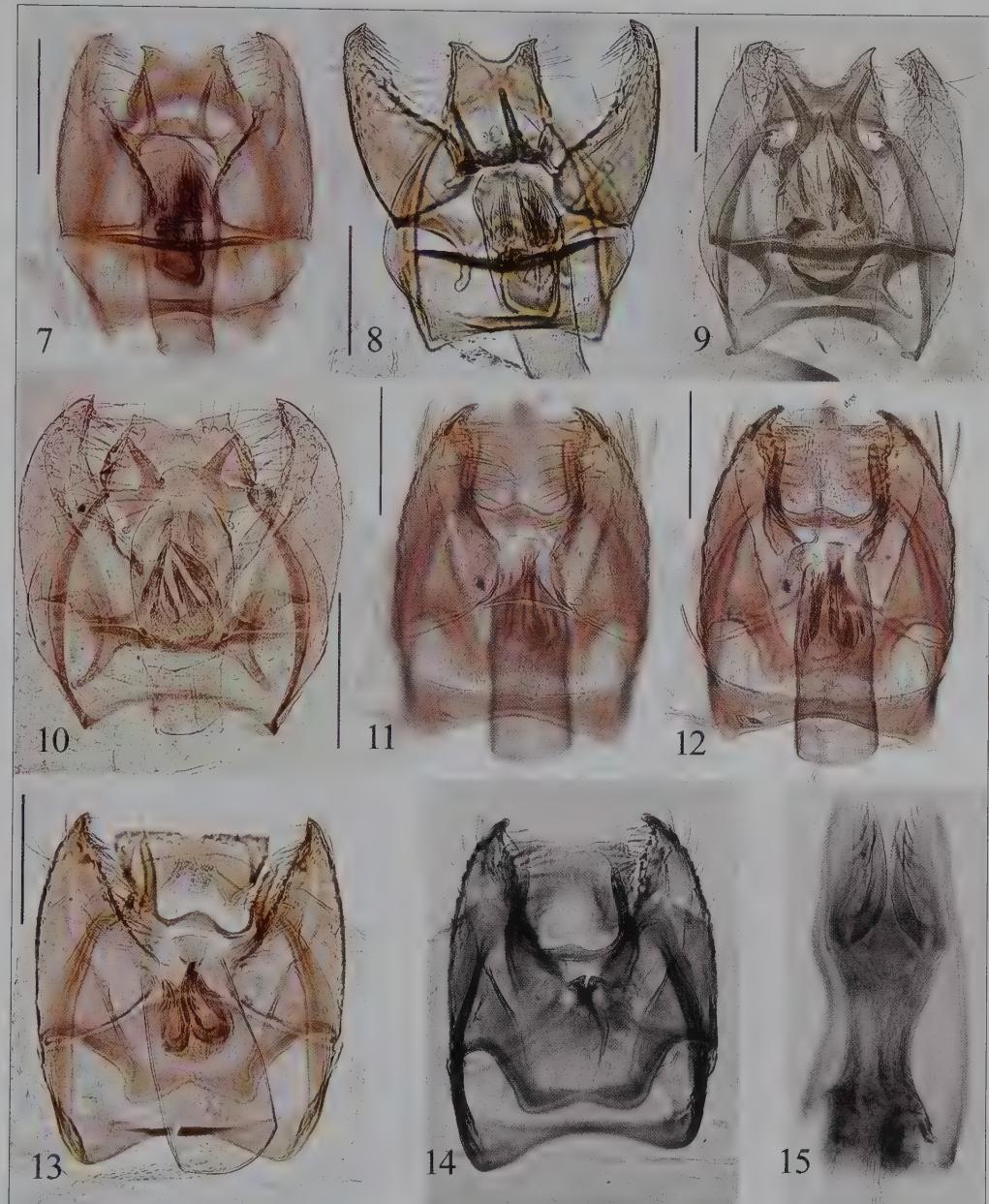
Other material: CANARY ISLANDS: 18♂ [EJvN3746, JCK15083] 2♀ [EJvN3980], Gran Canaria, Maspalomas, 21, 22, 24, 30.x.1991, 1, 2, 4.xi.1991, 24.iii.1992, 10, 12.iii.1993, 31.v.1993, 2.xi.1993, 27.xii.1994, leg. P. Grotenfelt (Helsinki, Leiden). EGYPT: 6♂ [JCK15153], Armant, 1.ii.1963, Min. Agric. Egypt (Washington, Leiden). INDIA: 1♂ [BM30252], Bihar, Pūsa, 15.vii.1911, T. Bainbridge Fletcher, paralecotype *Nepticula xystodes*; 4♂ [BM28319, BM30262], 1♀ [BM30263], Gujarat, Kheda (Kaira), 13.ii.1918, 24.ii.1925, R.M. Maxwell; 1♂ [BM30250], Gujarat, Nadiad, 4.xii.1937, R.M. Maxwell; 1♂ 1♀, Gujarat, Surat, 16.xii.1928, 2, 15.ii.1929, R.M. Maxwell; 1♂ [BM30251] 1♀, Karnataka, Amminbhavi, Dhārwād, 21.i., 3.ii.1916, R.M. Maxwell (all London). PALESTINE: 2♂ [EJvN3236], Jericho, 28.xii.1931, W. Einsler & H. Amsel (Karlsruhe, Leiden). SUDAN: 4♂ [VU0435, MV1716], Wadi-Halfa, 20.i., 1, 11.ii.1962, leg. Nubien Exped. Mus. Vindob. (Vienna, Leiden, coll. Johansson).

Diagnosis: The only nepticulid species in the UAE with uniform shining grey to grey-brown forewings. Male genitalia are unmistakeable, in the western Palearctic there are no species that could be confused with *S. xystodes*, whereas in the Paleotropics there are more species with similar genitalia.

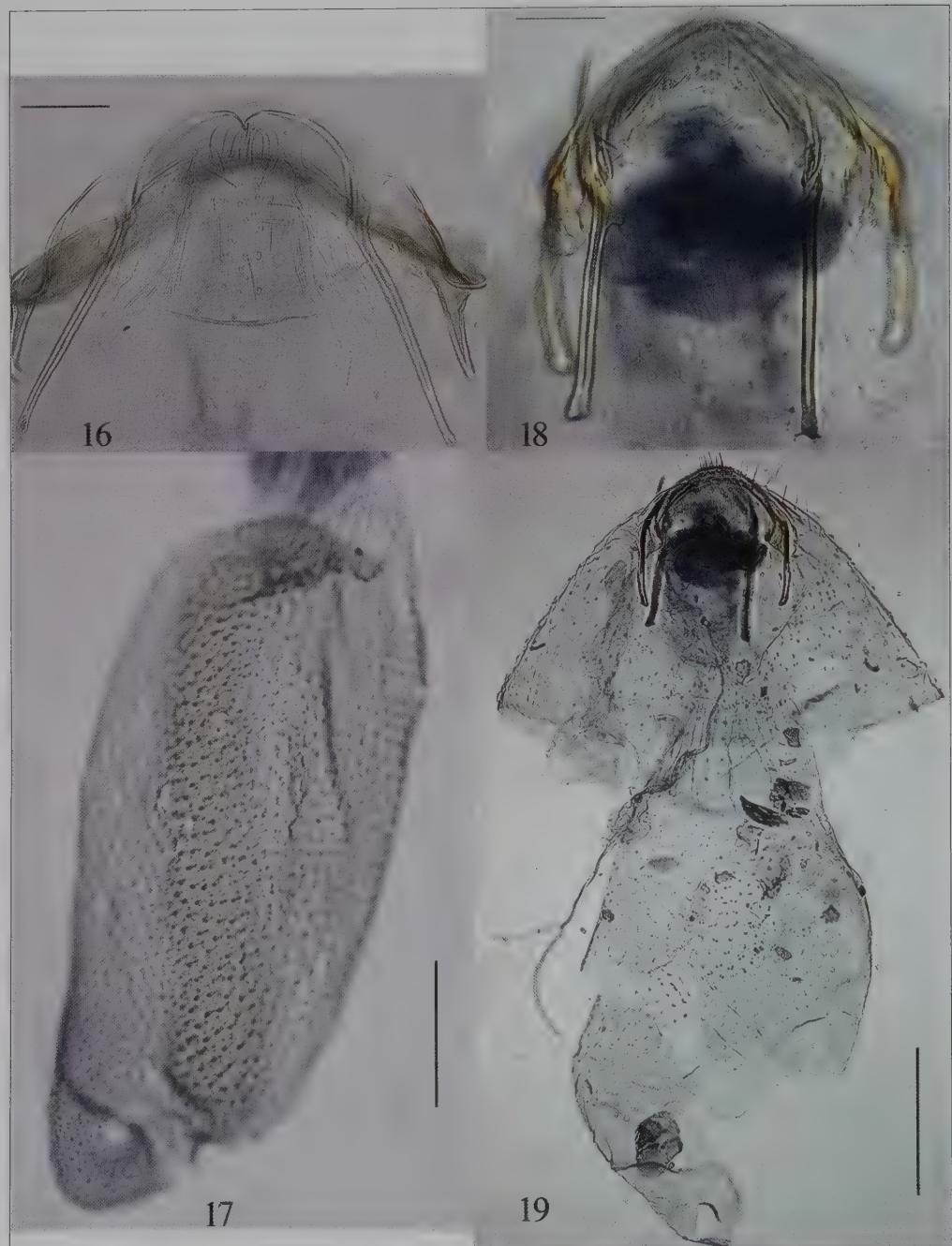
Redescription: Male. Forewing length 2.2–3.0 mm (2.6 ± 0.3 , 23), wingspan 4.9–6.6 mm. Head: frontal tuft pale ochreous, yellowish orange or dark brown, collar white. Scape white. Antenna paler greyish, with 25–30 (28.2 ± 1.5 , 20) segments. Thorax and forewing unicolorous shining ochreous grey, sometimes more bronze; terminal cilia concolorous. Hindwing pale silvery grey. Abdomen greyish, no visible anal tufts, vestiture on valvae concolorous. Underside abdomen and legs white.

Female. Forewing length 2.3–2.5 mm, wingspan 5.0–5.5 mm. Antenna with 21–23 segments. Otherwise as male.

Male genitalia. Capsule length 195–235 µm (219.1 ± 13.9 , 9). Vinculum anteriorly slightly excavated, posteriorly slightly protruded towards juxta. Tegumen band shaped. Uncus almost rectangular, with very slight medial indentation posteriorly. Gnathos with widely separate posterior processes, shorter but distinct, almost triangular anterior processes, transverse bar with small medial protuberance. Valva length 170–226 µm (184.1 ± 15.8 , 10), almost triangular, apex slightly narrowed, hardly curved inward, inner margin with subapical tooth. Juxta halter shaped, filling open space between valvae and vinculum, anteriorly wider than posteriorly; transtilla medially constricted, sublateral processes absent. Aedeagus 145–195 µm (165.2 ± 12.8 , 10) long, ratio aedeagus/capsule 0.7–0.8 (0.76 ± 0.04 , 9), tubular, with opening for ejaculatory duct at anterior end, coecum absent; vesica with distinct cathrema and posteriorly with symmetric set of 6 cornuti: two long curved ones, two shorter spines and two plates with serrate margin.



Plates 7–15. *Stigmella*, male genitalia. 7: *S. birgittae*, UAE, EJvN3831; 8: *S. birgittae*, holotype of *S. omani*, Pupl017; 9: *S. birgittae*, holotype, RM6713; 10: *S. zizyphi*, paratype of *S. ziziphivora*, RM6846; 11, 12: *S. xystodes*, UAE, EJvN3860; 13: *S. xystodes*, Sudan, EJvN0435; 14, 15: *S. xystodes*, lectotype, BM24106. Scale lines 100 µm.



Plates 16–19. *Stigmella*, female genitalia. 16, 17: *S. birgittae*, UAE, EJvN3865, dorsal view of abdominal tip (16) and corpus bursae (17); 18, 19: *S. xystodes*, Gran Canaria, EJvN3980, dorsal view of abdominal tip (18); complete genitalia (19). Scale lines 50 µm (16, 18), 100 µm (17), 200 µm (19).

Female genitalia. Total length ca 700–900 µm. Abdominal tip rounded, rather narrow; T8 with a few setae (up to 16 counted) and scales; anal papillae indistinct, without setae. Posterior apophyses narrow, longer than anterior ones. Bursa with small accessory sac, corpus bursae globular, covered with small single spines and pectinations, mostly concentrated in an elongated band; ductus spermathecae with 2–3 very shallow convolutions.

Biology: Hostplant is *Cyperus rotundus* (Fletcher, 1920). The hostplant is a problematic invasive weed, native to Asia, Africa and southern Europe, but now found on most continents. In the UAE it occurs along the coast, but not inland (Jongbloed, 2003), so that in the UAE locality Wadi Midaq *S. xystodes* probably feeds on another species, such as the widespread *C. conglomeratus*.

Leaf-mine. Larva yellow, transparent, head brown; mine starts either from the apex or middle of the leaf, the larva mines down for some length and then takes a turn and mines up, the second portion being exactly parallel to the first, frass in midline all along the mine; pupation in flat, golden-yellow oval cocoons (Fletcher, 1920). After Fletcher nobody else has recorded this mine.

Voltinism. Adults fly mostly in winter between October and April with one May record in Gran Canaria. In India, Bihar also found in July and August.

Remarks: *Nepticula xystodes* was described on the basis of two males, one is here designated as Lectotype (Plates 14, 15). *Nepticula liochalca* was reared by Fletcher (1920), who mentioned two specimens. However, Meyrick (1916) mentioned only one specimen, a female, which is thus the holotype, the same applies to *N. homophaea*. Since *N. xystodes* and *liochalca* are both described in the same paper and same page, I am acting as first reviser and give priority to *xystodes* over *liochalca*. This choice is based on the fact that males in *Stigmella* provide better diagnostic characters than the females, despite the fact that the *liochalca* holotype was reared. Also the majority of specimens both in Meyrick's collection and elsewhere are males. The conspecificity of the males and females is concluded on the fact that many specimens with the same external features occur in the Indian localities, with only one or two males probably belonging to a different, but closely related species. Also one female taken on Gran Canaria at the same locality as many males, has clearly similar genitalia as the few Indian females.

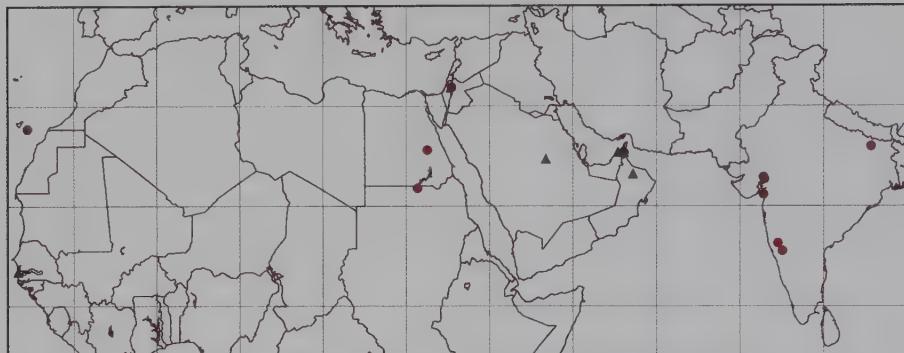
Distribution (Map 1): Widespread in northern and western India, single localities in UAE, Palestine, Egypt, Sudan and Gran Canaria, to be expected throughout this area. New for all these countries except India.

Genus *Acalyptis* Meyrick, 1921

Acalyptis species can best be recognised by the venation, but that character is hard to see without making a preparation (van Nieuwerken, 1986). The collar safely separates the Arabian species from similarly coloured *Stigmella*, but some *Ectoedemia* Busck, 1907 (not yet found in the UAE) might be hard to separate without dissection.

The genus *Acalyptis* is particularly well represented in tropical and subtropical areas, and less common in temperate regions (van Nieuwerken, 2007; Puplesis & Robinson, 2000; Scoble, 1980). The *Acalyptis platani* and *staticis* groups of Europe and the Mediterranean were recently treated by van Nieuwerken (2007). *Acalyptis gielisi* nov. spec. belongs to the *platani* group, see also phylogenetic discussion.

Three species are recognised from the *A. repeteki* group, a group in which eight species were recognised by Puplesis (1990, 1994), but he overlooked the fact that also the type species of the genus, *A. psammophrica* Meyrick, 1921, belongs to this group (van Nieuwerken, 1986). The species of this group, confined to desert areas, are very difficult to separate and some of



Map 1. Distribution of *Stigmella* species, green triangles: *S. birgittae*; red dots: *S. xystodes*.

the characters used originally seem to vary. Particularly the forewing colour, degree of sclerotization of abdominal sclerites, and valval length and shape seem to be variable. A further two species are only known from females (*A. psammophicta* and *A. vittatus* (Puplesis, 1984)). It is, therefore, likely that the actual number of species is lower than eight. Unfortunately the biology of this group remains unknown, and can thus shed no light on species boundaries. On the basis of careful comparison of material from various localities, including the UAE, and the DNA sequences of UAE specimens, the type species is now associated with males previously identified as *A. lvovskyi* (Puplesis, 1984), and the synonymy is established. Another – usually much larger – species, with a distinct dark stripe on the forewing, often occurring together with *A. psammophicta* (but not yet found in the UAE) is *A. falkovitshii* (Puplesis, 1984), which may be the same as *A. arenosus* (Falkovitsh, 1986) and *A. vittatus* (Puplesis, 1984). The second species in the UAE is here identified as *A. repeteki* (Puplesis, 1984), the third as *A. galinae* (Puplesis, 1984).

Acalyptris gielisi van Nieukerken nov. spec.

Plates 20, 21, 28–30, 33–36

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Maidaq, 460 m, 25°20'N 56°07'E, 16.iv.2006, leg. C. Gielis, sta 70, Genitalia slide EJvN 3861 (Leiden). Paratype ♀, same data, Genitalia slide EJvN 3940 (Leiden).

Diagnosis: Males are easily recognised by the dark androconial scales on the hindwings and characteristic genitalia. Females can only be identified after dissection. Male genitalia very similar to those of *A. lanneivora* (see below).

Description: Male. Forewing length 1.9 mm, wingspan 4.2 mm. Head: frontal tuft pale ferruginous, collar ochreous white. Scape small, ochreous white. Antenna pale brown, with 31 segments. Thorax and forewing pale ochreous white, a few darker ochreous scales on wings. Hindwing basal third covered with dark brown androconial scales, a darker concentration near frenulum; costal bristles absent. Abdomen ochreous white, including vestiture on genitalia; anal tufts inconspicuous.

Female. Forewing length 2.1 mm, wingspan 4.5 mm. Antenna with 30 segments. Brown scales on hindwing absent.

Male genitalia. Capsule length 430 µm. Vinculum with long and rounded anterior extension. Tegumen a narrow hairy pseuduncus. A pair of lateral support rods from gnathos along vinculum lateral arms. Uncus with small tip, divided in lateral view. Gnathos with pointed

central process, not reaching uncus tip. Valva 215 µm long, about 1/2× capsule length, narrow, at basis with small posteriorly directed digitate process with some setae on tip, and midway a rounded inward projection, apex setose; transtilla absent. Aedeagus 340 µm long; with ventral bifurcate carinate process; a pair of lateral, pointed carinae and an asymmetric dorsal lobe; vesica with many small cornuti.

Female genitalia. Total length ca 1100 µm, corpus bursae ca 750 µm. Abdominal tip strongly pointed, anal papillae narrow, each with ca. 12 setae; T8 with a few setae, no scales. Vestibulum with a vaginal sclerite at left side [broken in slide], and internally with a group of many close-set spines; corpus bursae elongate, narrowed anteriorly, without sclerotizations on wall, except a pair of reticulate signa, 305 and 330 µm long, with crenulated margins and 4–5 cells wide. Ductus spermathecae lost in preparation.

Biology: Hostplant unknown (see below). Adults flying in April.

Remarks: Particularly in the male genitalia *A. gielisi* is extremely similar to *A. lanneivora* (Vári, 1955) from South-Africa, but the androconial scales in *A. gielisi* (absent in *lanneivora* types) and the female genitalia (Plate 37) separate the species. Scoble (1980: Fig. 12) cited two subsequent specimens that also show these androconials: they could either also be *geliisi* or another species. In the male genitalia *A. lanneivora* is characterised by a longer valva (ca 60% of capsule length) and longer gnathos (almost reaching uncus) (Plates 31, 32).

Acalyptris lanneivora feeds on the tree *Lannea discolor* (Anacardiaceae) (Scoble, 1980; Vári, 1955), but this plant species and genus are absent from the UAE. In fact the whole family Anacardiaceae is poorly represented with just *Pistacia kinjuk*, only known from a single locality in the far north (Jongbloed, 2003). It is thus likely that despite the similarity, *A. gielisi* uses another host plant family.

The conspecificity of the male and female described here was suggested by the same locality and date, and corroborated by the analysis of the CO1 gene, which show a 99.4% similarity, only differing in two basepairs (see below) and the 28S gene which is 100% similar.

Etymology: This species is dedicated to Cees Gielis, who collected the types, and the majority of microlepidoptera of the UAE as treated in this series.

Distribution: UAE.

Acalyptris psammophrica Meyrick, 1921

Plates 22–24, 38–40, 44, 46, 47

Acalyptris psammophrica Meyrick, 1921: 410 – Holotype ♀, INDIA: Ahmedabad, Bombay [now Ahmadābād, Gujarat], 5.x.[19]18, R M[axwell], genitalia slide BM22601 (London) [examined].

Microcalyptris lvovskyi Puplesis, 1984: 494 – Holotype ♂, MONGOLIA: Bajan Chongor aimak [Bayanhongor prov.], 160 km S Shine-Dzhinsta [Shinejinst], 11.viii.1981, A. Lvovsky, genitalia in glycerine (St. Petersburg) [examined] nov. syn.

[*Acalyptris falkovitshi*; van Nieuwerken, 1986: fig. 24 [abdominal tufts]; van Nieuwerken & Dop, 1987: 117, fig. 27 [antennal sensilla]. Misidentifications]

Specimens examined: UAE: Al-Ajban, 75 m, 1♂ [EJvN3866, genitalia lost], 27.iii.2006, leg. C. Gielis. 5 km SE of Mahafiz, 4♂ [EJvN3732, 3982], 25.iii.2006, leg. C. Gielis; 2♂ [EJvN3868]; 4.iv.2006, leg. C. Gielis; 1♀ [EJvN3846], 17.iv.2006, leg. C. Gielis. Sharjah Desert Park, 1♂ [ethanol material], 25.i–22.ii.2005, in light trap, leg. A. van Harten.

Other material: IRAN: 17 km E Bandar Abbas, Dunes, 1♂ [VU1432], 1♀, 15.iv.1972; 2♀ [VU1272], ibidem, 21, 24.iv.1974. 8 km E Bandar Abbas, Dunes, 2♀ [VU0922], 11.iv.1972, all Exp. Mus. Vind. (Vienna, Leiden). ISRAEL: Tel-Aviv, Dunes, at light, 1♂ [EJvN2360], 19.v.1930, H. Amsel (Karlsruhe). LIBYA, Gharian, Wadi El Hira, 2♂ [EJvN3992], 6.v.1983, U. Seneca (Copenhagen, Leiden). PAKISTAN: 150 km SW of Quetta, 1♂ [VU0484], 13.v.1965, Kasy & Vartian (Vienna). TUNISIA: Nefta, 5♂ [VU1271; SEM 11.6], 20, 31.iii, 29.iv.1927, L. Dumont (Paris, Leiden); Nefta, 1♂ [EJvN3128], 14–16.iii.1986, Zool. Mus. Copenhagen Exp.; Nefta area, 1♂ [EJvN3985], 1–4.v.1988, O. Karsholt (Copenhagen). TURKMENISTAN: Sandy-Katschi [Sandikachi], 20♂ [EJvN3990, JCK15209, 15210, 15211, glyc. preps], 2♀ [EJvN3991], 29.iv–5.v.1986, R. Puplesis (Leiden).



Plates 20–27. *Acalyptris*, adults. 20: *A. gielisi*, ♂, holotype; 21: *A. gielisi*, ♀, paratype; 22, 24: *A. psammophrica*, ♂, 5 km SE Of Mahafiz, EJvN3982; 23: *A. psammophrica*, ♀, 5 km SE of Mahafiz, EJvN3846; 24: Lateral detail abdomen of 22; 25: *A. repeteki*, ♂, EJvN3847; 26: *A. galinae*, ♂, EJvN3981; 27: *A. species*, ♀, EJvN3867. Scale lines 1 mm.

UZBEKISTAN: 70 km NW Gazli, Kyzylkum, 1♂, [EJvN3745], 26.v.1965, Falkovitsh, paratype *Microcalyptis lvovskyi* (Leiden).

Diagnosis: The long abdominal tufts on segments 4–8 separate male *A. psammophrica* immediately from other UAE Nepticulidae, but also *A. pallens* (Puplesis, 1984) and *A. falkovitshi* (Puplesis, 1984) have similar tufts, and could be expected to occur here. *A. falkovitshi* is usually much larger and has a dark stripe on the forewings, the gnathos is pointed; *A. pallens* has a rounded gnathos and very wide uncus (see also Puplesis, 1990). Female *A. psammophrica* can be recognised from other UAE species by the broad, hairy abdominal tip, and other genitalia characters, but the females of *A. repeteki* and *A. galinae* are as yet unknown.

Redescription: Male. Forewing length 2.3–3.2 mm (2.7 ± 0.3 , 18), wingspan 4.9–6.9 mm. Head: frontal tuft pale ochreous, or pale yellowish orange, collar ochreous white. Scape small, ochreous white. Antenna pale brown, with 33–44 (39.2 ± 3.4 , 13) segments. Thorax unicolorous pale ochreous; forewing ochreous, irrorate with pale brown scales, occasionally brown scales covering wing almost completely, except narrow stripe along dorsal margin; terminal cilia concolorous. Hindwing pale ochreous; costal bristles present. Abdomen ochreous white, on segments 4–8 with long ochreous dorsal scale tufts, hairscales pointing posteriorly, completely covering rest of abdomen; abdominal tergites 4–8 in addition with narrow, reinforced sclerotizations anteriorly to scale tufts, with medial posterior projection between the tufts; these sclerotizations only well visible in microscopic preparations, amount and visibility of sclerotization may vary. Underside completely pale ochreous.

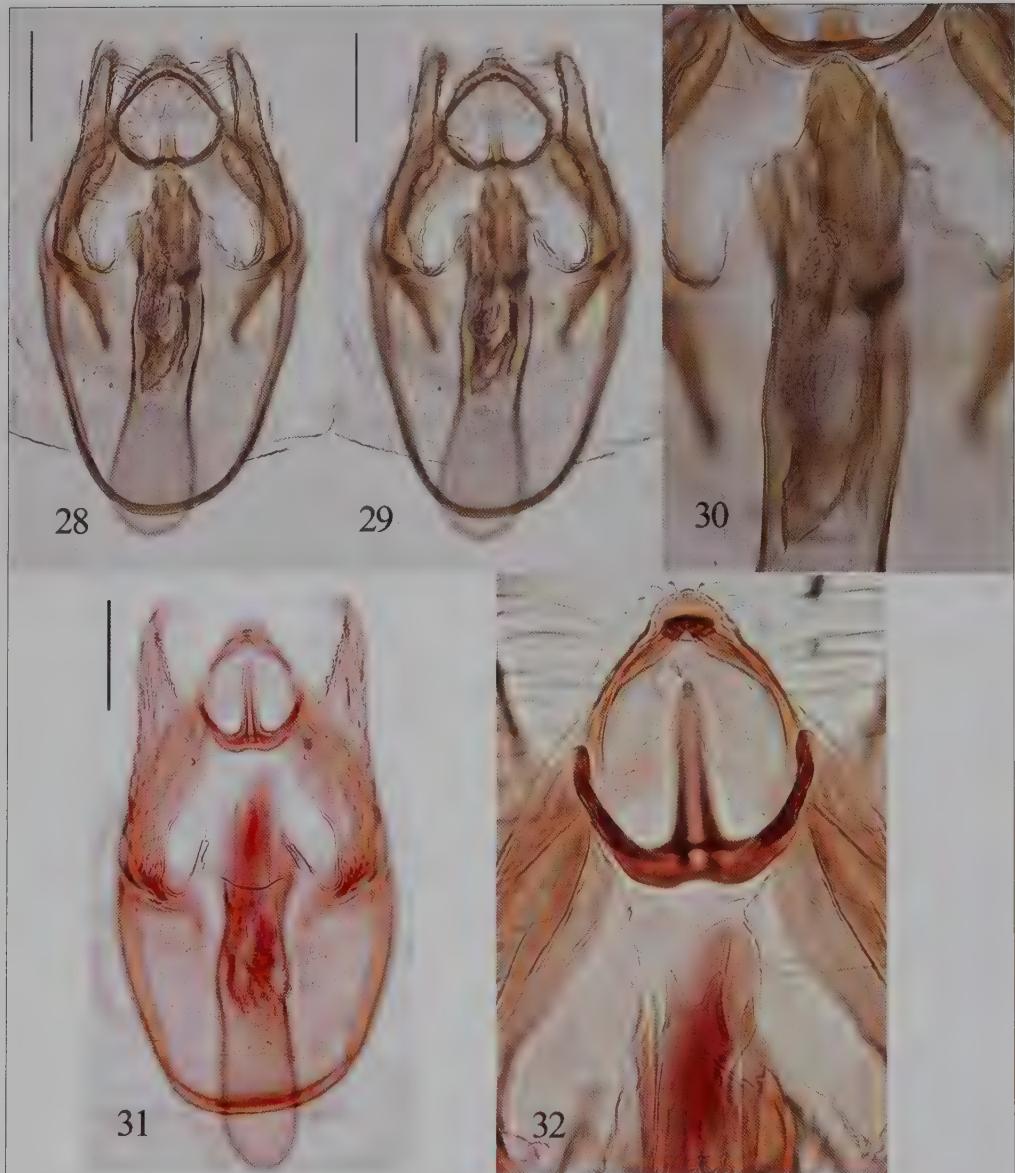
Female. Forewing length 2.3–2.9 mm (2.6 ± 0.2 , 8) mm, wingspan 5.1–6.4 mm. Antenna with 33–40 (36.9 ± 2.6 , 7) segments. Abdominal tufts absent; abdominal tip broad and blunt, hairy.

Male genitalia. Capsule length 345–437 µm (376.1 ± 26.4 , 13). Vinculum anteriorly slightly excavated, posteriorly with rounded extension, joined to ventral process of aedeagus; a pair of support rods along lateral arms. Tegumen bilobed, setose. Uncus with short central element, divided dorso-ventrally. Gnathos with long central element, apex truncate or slightly excavate. Valva elongate, 213–271 µm (234.6 ± 16.3 , 13) long, with almost parallel sides, or slightly constricted in middle; a pecten of ca 30–55 close-set spines runs along inner margin in posterior half and around apex; length usually about half valval length, sometimes shorter; transtilla absent. Aedeagus length 280–350 µm (316.6 ± 18.9 , 13); with a central tongue shaped carinal process and pair of pointed lateral carinae; vesica with many small spinelike or scobinate cornuti.

Female genitalia. T8 narrow, laterally produced into setose lobes, no scales present. T9 ending in two widely separate hairy anal papillae each with many setae (ca 35), in dorsal view overlapped by T8. S7 with row of long setae. Vestibulum folded, with indistinct sclerotization at right side. Corpus bursae bulbous, 550–600 µm long, without pectinations; reticulate signa long, 350–440 µm long, both almost of similar length, 7–11 cells wide. Ductus spermathecae with 3–3.5 convolutions.

Biology: Hostplant unknown, always in deserts or coastal dunes (Tel Aviv). Adults flying from February to May in Middle East and Northern Africa, May to June and August–September in central Asia, October in India.

Remarks: *Acalyptis psammophrica* was described from a single female from western India, and redescribed by me (van Niekerken, 1986). At that time I noticed already the close resemblance to some Iranian specimens (recorded here). With more material, including the female from the UAE, it is now clear that they are conspecific with *A. psammophrica*. The males, associated in the present material and in Bandar Abbas in Iran, with truncate uncus, long abdominal tufts and irrorate wings are similar to material identified by Puplesis as *A. lvovskyi*, including one paratype. The holotype of *A. lvovskyi* was studied by me in 1985, and



Plates 28–32. *Acalyptaris*, male genitalia. 28–30: *A. gielisi*, holotype, EJvN3861, with detail of aedeagal tip and carinae (30); 31–32: *A. lanneivora*, holotype, TM6743, S Africa, Pretoria, 3.ii.1951, L. Vári. Scale lines 100 µm.

notes made then confirm the identity with the other material, despite some variation in valva length and shape and forewing pattern. The conspecificity of the UAE material is further corroborated by the CO1 gene, identical in three specimens, and with 99.6–99.8% similarity (1–2 nucleotide differences) between these and the other two (see below).

Puplesis (1990) synonymised *Microcalyptris turanicus* Puplesis, 1984, with *A. Ivvovskyi*, but because *turanicus* has a pointed gnathos, I think it is more likely to be *A. falkovitshi* (Puplesis, 1984). The remarkably formed sensillum vesiculocladum on the flagellar segments was illustrated and described by van Nieukerken & Dop (1987), incorrectly under the name *A. falkovitshi* Puplesis.

Distribution (Map 2): From India westwards to Tunisia and northwards to Mongolia. New records for Pakistan, Iran, UAE, Israel, Libya and Tunisia.

***Acalyptris repeteki* (Puplesis, 1984)** Plates 25, 41, 42, 45

Microcalyptris repeteki Puplesis, 1984: 494 – Holotype ♂, TURKMENISTAN: Repetek, 4.v.1983, M. Falkovitsh, genitalia in glycerine (St. Petersburg) [examined]

Specimens examined: UAE: Sharjah Desert Park, 80 m, 1♂ [EJvN3847], 10.iv.2006, leg. C. Gielis.

Diagnosis: Males can be separated from *A. psammophrica* by the absence of very long abdominal tufts, although short tufts are present, but rather inconspicuous. In the male genitalia the gnathos is pointed and the valval pecten is comparatively short on a very long valva (ca $0.7 \times$ capsule length). *A. galinae* differs by smaller size and considerably shorter valvae (ca. half capsule length).

Redescription: Male. Forewing length 2.6 mm, wingspan 5.6 mm. Head: frontal tuft pale ochreous, collar ochreous white. Scape small, ochreous white. Antenna pale brown, with 37–41 (n=2) segments. Thorax unicolorous pale ochreous; forewing ochreous, irrorate with pale brown scales. Hindwing pale ochreous. Abdomen ochreous white, on segments 5–8 with short inconspicuous ochreous dorsal scale tufts (sockets difficult to see in slide preparations); abdominal tergites without reinforced sclerotizations. Underside completely pale ochreous.

Female. Unknown.

Male genitalia. Capsule length ca 370 µm. Vinculum anteriorly slightly excavated, posteriorly with rounded extension, joined to ventral process of aedeagus; a pair of support rods along lateral arms. Tegumen bilobed, setose. Uncus with truncate central element. Gnathos with long, pointed central element. Valva elongate, ca 260 µm long, with almost parallel sides; a pecten of ca 28 close-set spines runs along inner margin in posterior third and around apex; transtilla absent. Aedeagus length ca 300 µm; with a central tongue-shaped carinal process and pair of pointed lateral carinae, dorsally an asymmetrical lobe; vesica with a few small spinelike cornuti.

Biology: Hostplant unknown, in deserts. Adults known from April (UAE) and May.

Remarks: *A. repeteki* has only been found twice, the holotype and the present specimen.

Distribution: Turkmenistan and UAE. New for the UAE.

***Acalyptris galinae* (Puplesis, 1984)** Plates 26, 43

Microcalyptris galinae Puplesis, 1984: 502 – Holotype ♂, MONGOLIA: Bajan Chongor aimak, [Bayanhongor prov.], 160 km S Shine-Dzhinsta [Shinejinst], 3–11.viii.1981, A. Lvovsky, genitalia in glycerine (St. Petersburg) [not examined]

Microcalyptris galinae mesasiaticus Puplesis, 1984: 503 – Holotype ♂, UZBEKISTAN: Zhamansaj, 140 km NW Shafirkan [Safirkon], 20.v.1967, M. Falkovitsh, genitalia in glycerine (St. Petersburg) [not examined]

Specimens examined: UAE: Sharjah Desert Park, 80 m, 1♂ [EJvN3981], 10.iv.2006, leg. C. Gielis.

Other material: TURKMENISTAN: Sandy-Katschi, 5♂ [JCK15208, glyc. preps], 29.iv–3.v.1986, R. Puplesis (Leiden).

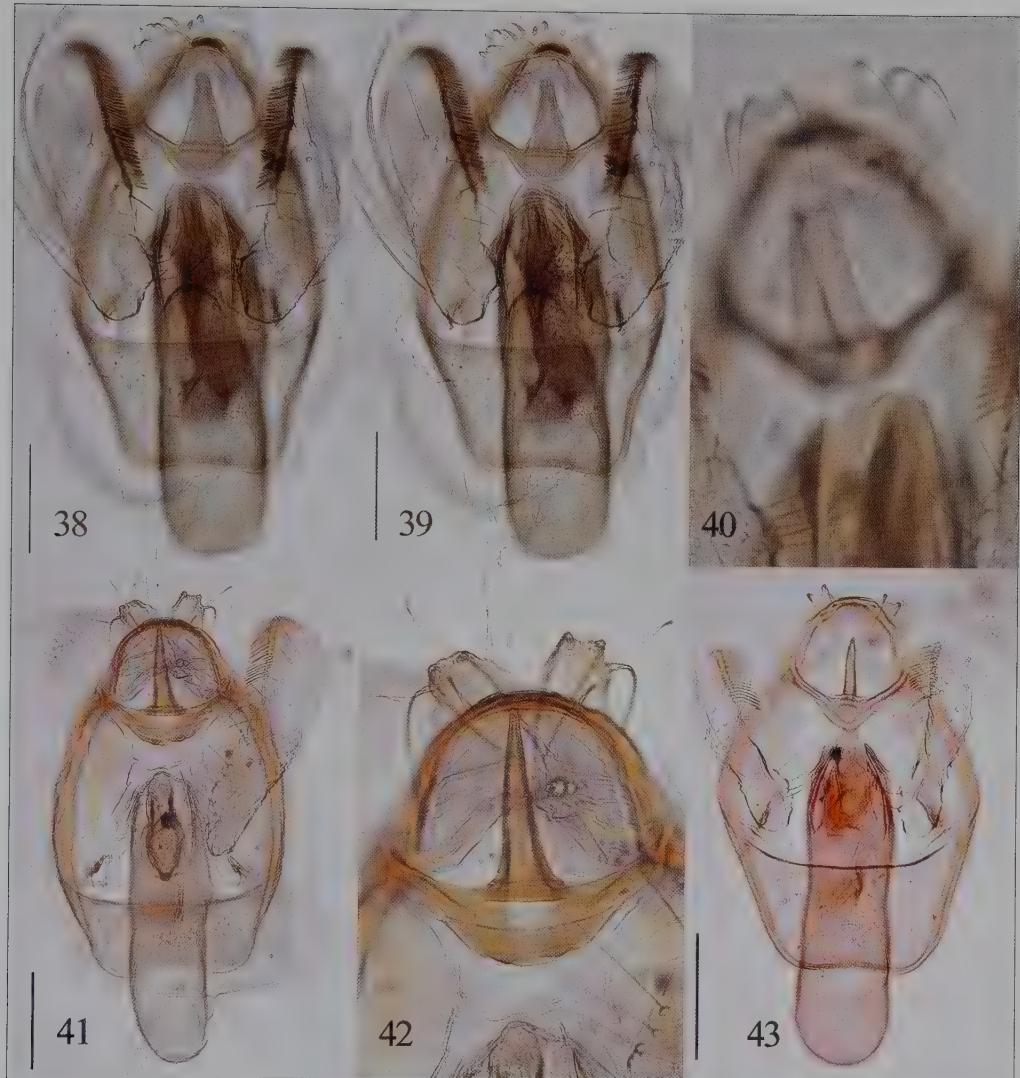
Diagnosis: See *A. repeteki*.

Redescription: Male. Forewing length 2.0–2.5 mm (2.3 ± 0.2 , 6), wingspan 4.4–5.5 mm. Head: frontal tuft pale ochreous, collar ochreous white. Scape small, ochreous white. Antenna pale brown, with 24–34 (28.6 ± 4.1 , 5) segments. Thorax unicolorous pale ochreous; forewing



Plates 33–37. *Acalyptaris*, female genitalia. 33–36: *A. gielisi*, paratype, EJvN3940, details of signa (34, 35) and vestibulum (36); 37: *A. lanneivora*, paratype, TM6744, S Africa, Pretoria, 21.iv.1950, L. Vári. Scale lines 100 µm (33), 50 µm (36), 200 µm (37).

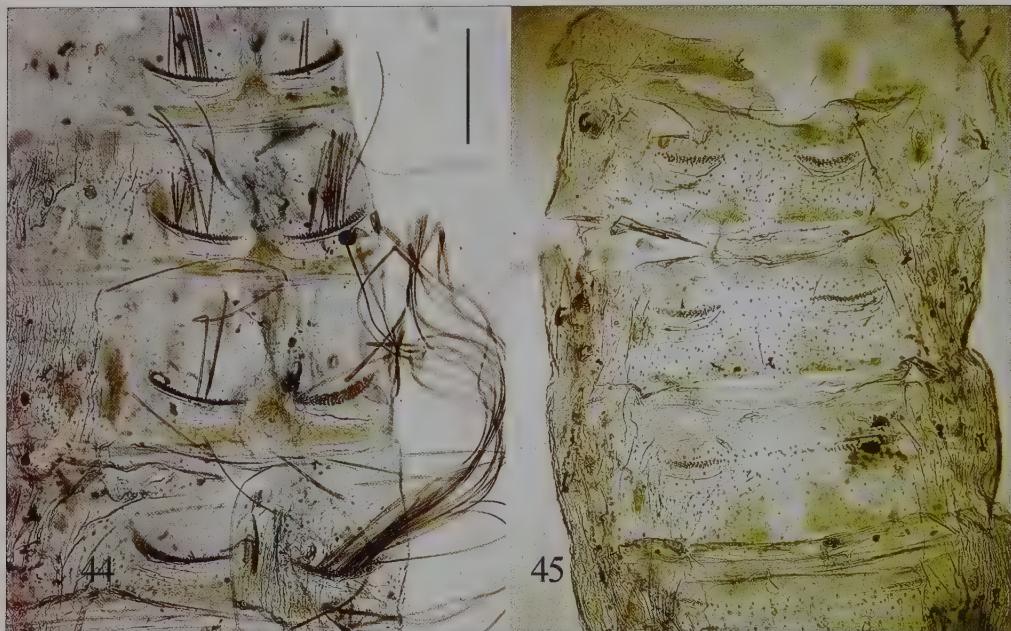
ochreous, irrorate with pale brown scales. Hindwing pale ochreous. Abdomen ochreous white, on segments 5–8 with short inconspicuous ochreous dorsal scale tufts (sockets difficult to see in slide preparations); abdominal tergites without reinforced sclerotizations. Underside completely pale ochreous.



Plates 38–43. *Acalyptris repeteki* group, male genitalia. 38–40: *A. psammophrica*, 5 km SE Mahafiz, EJvN3732 (38, 39), EJvN3868 (40), with detail of uncus; 41–42: *A. repeteki*, EJvN3847, with detail of gnathos and uncus; 43: *A. galinae*, EJvN3981. Scale lines 100 µm.

Female. Unknown.

Male genitalia. Capsule length ca 300 µm. Vinculum anteriorly slightly excavated, posteriorly with rounded extension, joined to ventral process of aedeagus; a pair of support rods along lateral arms. Tegumen bilobed, setose. Uncus with truncate central element. Gnathos with long, pointed central element. Valva elongate, 160–165 µm long, slightly more than half capsule length, with almost parallel sides; a pecten of ca 18–20 close set spines runs along inner margin in posterior third and around apex; transtilla absent. Aedeagus length 270–295



Plates 44–45. *Acalyptaris repeteki* group, abdomen in slide preparation. 44: *A. psammophrica*, EJvN3732, large tufts of long scales and strong sclerotizations; 45: *A. repeteki*, EJvN3847, smaller tufts of short scales and indistinct sclerotizations.

µm (n=2); with a central tongue shaped carinal process and pair of pointed lateral carinae, dorsally an asymmetrical lobe; vesica with a few small spinelike cornuti.

Biology: Hostplant unknown, always in deserts. Adults flying from April to June (April in UAE).

Remarks: A division in subspecies as originally suggested was not followed in later treatments (Puplesis, 1990; 1994) and is also not followed by me.

Distribution: Mongolia, Uzbekistan, Turkmenistan. New for the UAE.

Acalyptaris spec.

Plates 27, 48, 49

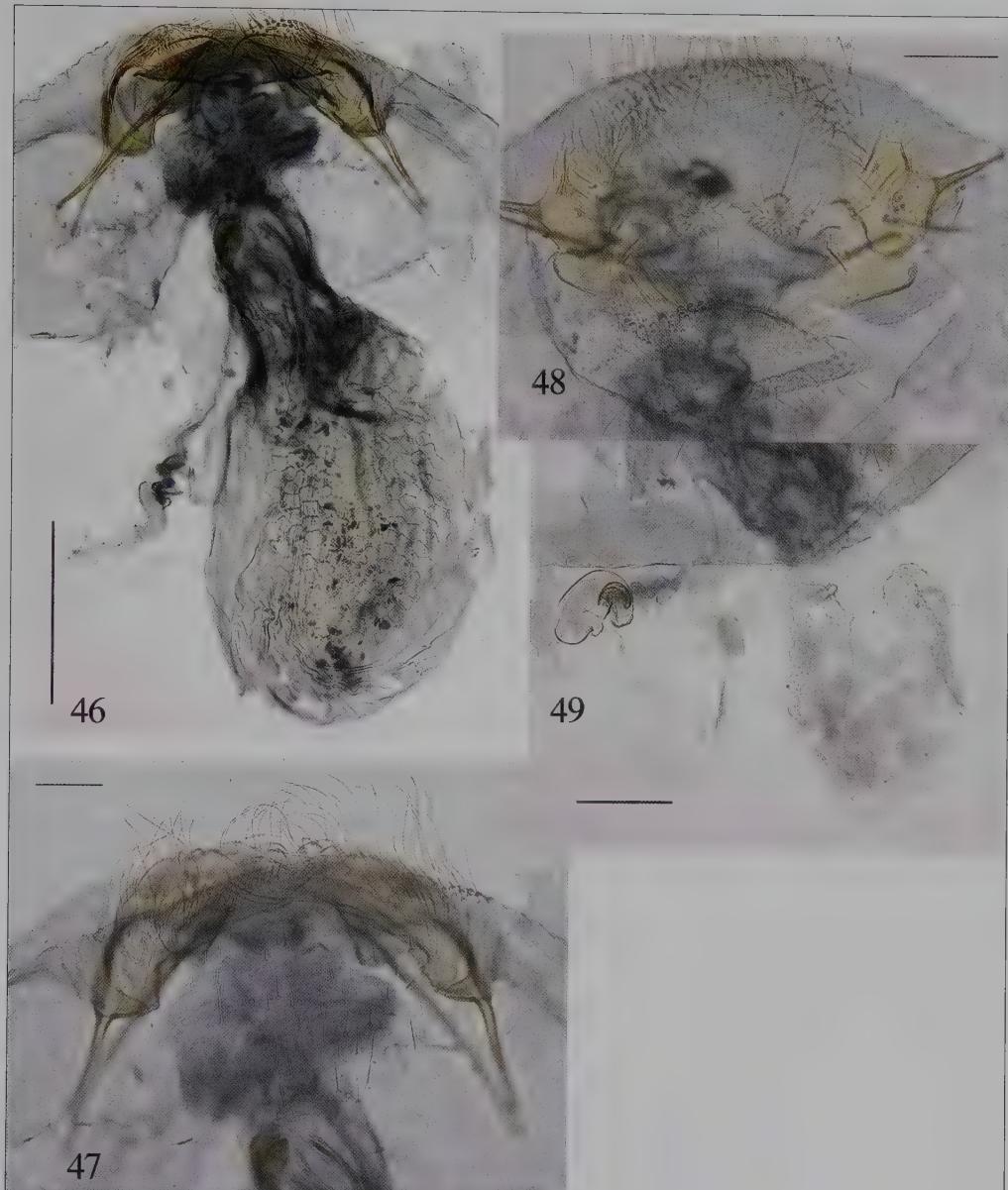
Specimens examined: UAE: Al-Ajban, 80 m, 1♀ [EJvN3867], 10.xi.2007, leg. C. Gielis.

Diagnosis: This female differs from other UAE Nepticulidae by almost pure white wings, irrorate with black scales. The genitalia are characteristic, separated from *A. psammophrica* by very short bursa and signa.

Redescription: Male. Unknown.

Female. Forewing length 2.8 mm, wingspan 6.3 mm. Head: frontal tuft pale ochreous, collar white. Scape small, white. Antenna pale brown, 36 segments. Thorax and forewings almost unicolorous yellowish white; forewing irrorate with some black-tipped scales, particularly along fringe line. Hindwing silvery white.

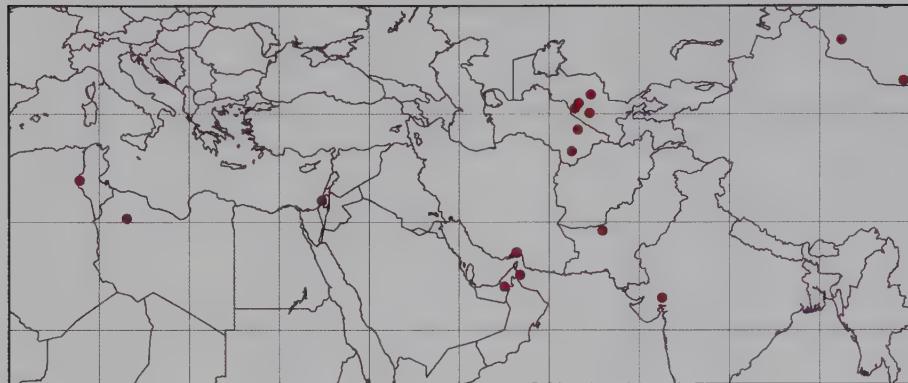
Female genitalia. T8 not distinctly recognizable, covered with many long setae. T9 forming two separate hairy anal papillae each with many setae (ca 40). S7 also with many long setae. Apophyses short, configuration as shown in photograph possibly, but not certainly a



Plates 46–49. *Acalyptaris*, female genitalia. 46–47: *A. psammophricta*, EJvN3867, complete genitalia in dorsal view and terminal segments focussed more ventrally; 48–49: *Acalyptaris* spec., terminal segments in dorso-caudal view and bursa. Scale lines 50 µm (47), 100 µm (48, 49), 200 µm (46).

preparation artifact. Vestibulum folded, no sclerotizations. Corpus bursae very small, ca 470 µm long, without pectinations; reticulate signa very short, slightly dissimilar, respectively 155 and 170 µm long, ca 6 indistinct cells wide. Ductus spermathecae with 3 convolutions.

Biology: Unknown.



Map 2. Distribution of *Acalyptis psammophrica*.

Remarks: This female almost certainly represents a new species. I refrain from naming it here on the basis of a single female. There is a remote possibility that the female belongs to one of the species only known from males, described from Central Asia or Africa. However, the phylogenetic analysis strongly suggests that this species belongs to the *A. staticis* group.

Distribution: only known from the UAE.

MOLECULAR ANALYSIS

In Figure 1 the neighbour joining tree of the CO1 sequences is given, together with those of the European and Mediterranean *Acalyptis* species and the type species of *Stigmella* (all from van Nieukerken, 2007). The conspecificity of the different specimens of *Tischeria ptarmica* Meyrick, 1908, *Stigmella birgittae* and *Acalyptis psammophrica* is clearly seen, there are hardly differences; the larger difference of *S. birgittae* 23731 is an artefact, due to short sequence length. The maximum parsimony analysis of the same CO1 sequences found six shortest trees, with a length of 313 steps, consistency index = 0.476 and retention index = 0. 666. Of 665 characters, 206 are parsimony informative. The strict consensus tree is well resolved, and the only difference with the majority rule consensus tree (Fig. 2) is the resolution on the European *platani* group.

The data here show the monophyly of the *A. repeteki* group, and the correct placement of *A. gielisi* in the *platani* group, although both have no bootstrap support. *Acalyptis* species (23867) most likely belongs to or is closely related to the *A. staticis* group.

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I would like to thank Cees Gielis (Lexmond, Netherlands) and Jaroslaw Buszko (Torún, Poland) for collecting these tiny moths, and Tony van Harten (Sharjah, UAE) for undertaking this huge and interesting project, and his editorial work. For the loan or gift of material I am indebted to: Don Davis (Washington DC, USA), Bert Gustafsson (Stockholm, Sweden), Roland Johansson (Växjö, Sweden), Lauri Kaila (Helsinki, Finland), Ole Karsholt

Tischeria ptarmica 23733

Tischeria ptarmica 23979

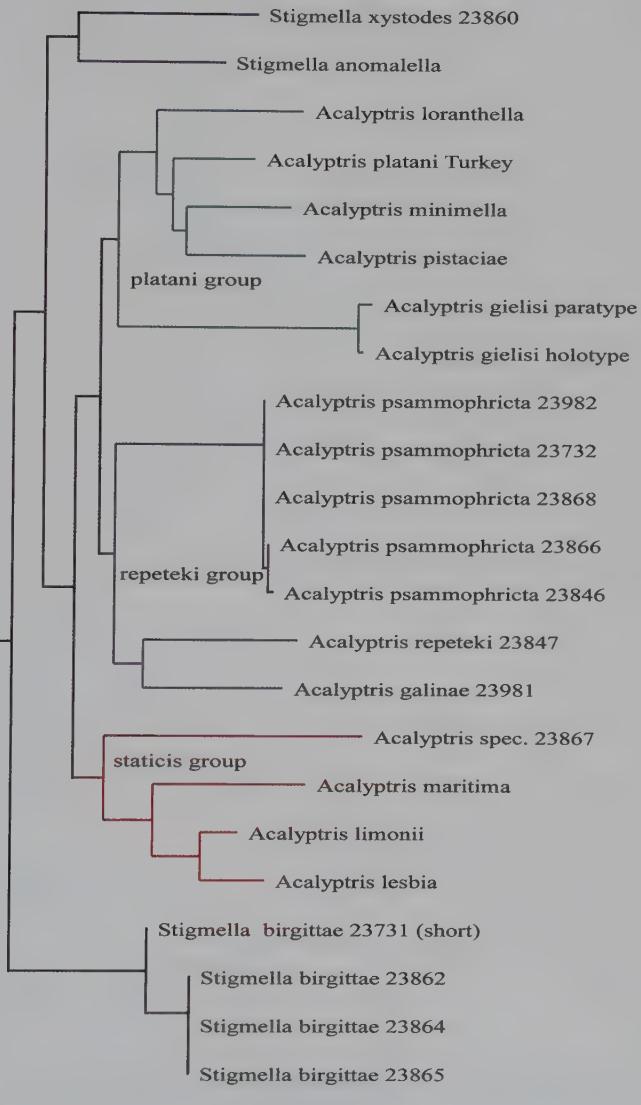


Figure 1. Neighbour joining tree of CO1 sequences of UAE Nepticulidae and Tischeriidae combined with the *Acalyptis* species and *Stigmella anomalella* (type species) from van Nieuwerken (2007), with relative distances (K2P distances). The three species groups of *Acalyptis* are indicated by different colours. Numbers refer to RMNH registry numbers (table 1).

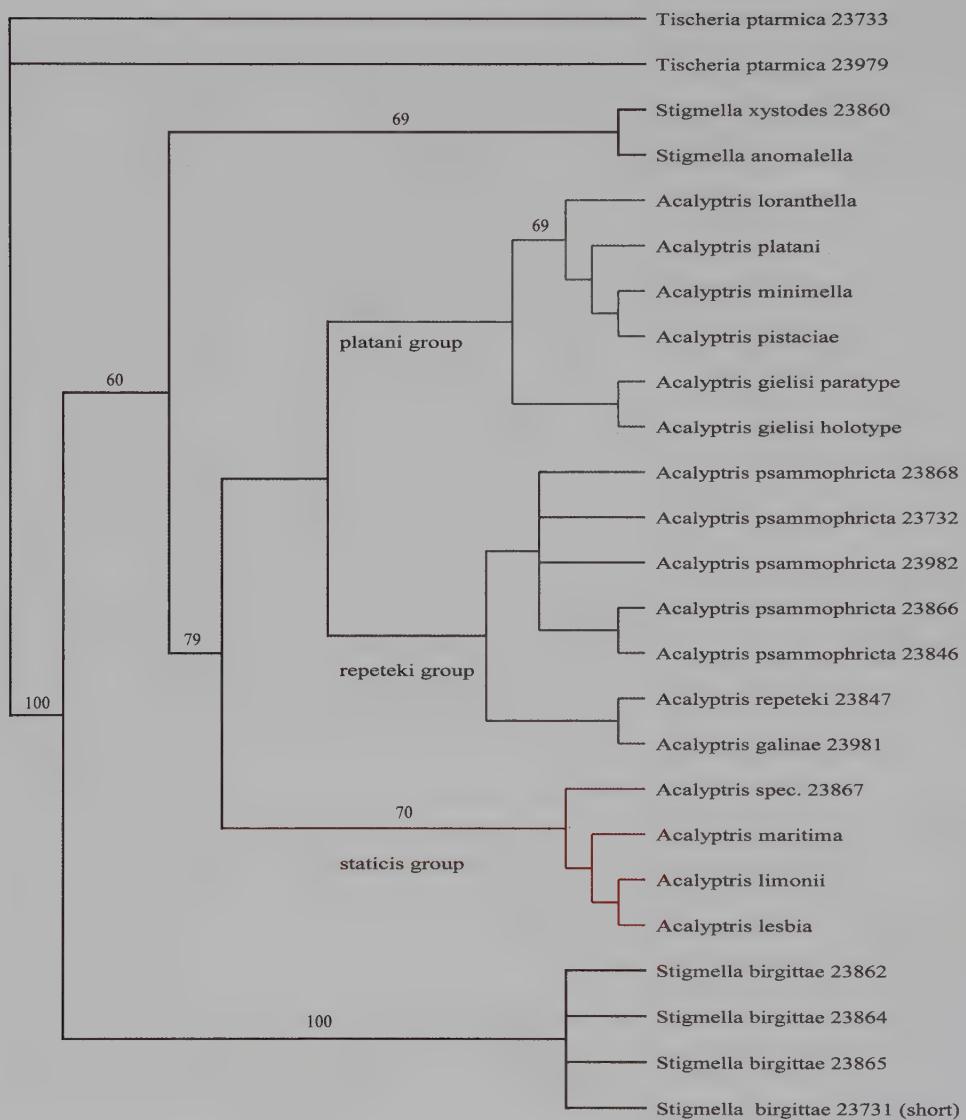


Figure 2. Cladogram of UAE Nepticulidae and Tischeriidae (as outgroup) combined with the *Acalyptaris* species and *Stigmella anomalella* (type species) from van Nieukerken (2007), based on mitochondrial COI sequences. Majority rule consensus tree of six shortest trees, found with heuristic search. Figures indicate bootstrap values (larger than 50), found after 100 bootstrap replicates with each 100 addition sequence replicates. The three species groups of *Acalyptaris* are indicated by different colours. Numbers refer to RMNH registry numbers (table 1).

(Copenhagen, Denmark), the late Friedrich Kasy (Vienna, Austria), Martin Kruger (Pretoria, South Africa), Gérard Luquet (Paris, France), Kevin Tuck (London, UK), U. Roesler (formerly Karlsruhe, Germany) and Jonas R. Stonis (Puplesis) (Vilnius, Lithuania). Sjaak Koster (Losser, Netherlands) is acknowledged for making genitalia preparations, and Frank Stokvis and Camiel Doorenweerd (Naturalis, Netherlands) for molecular analyses.

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Table 1. Specimen data for vouchers and CO1 sequences of Nepticulidae and Tischeriidae of the UAE.
fl = fragment length.

Species	Sex	Voucher ID	Gen. slide	BOLD ID	Genbank ID	fl
<i>Stigmella birgittae</i>	♂	RMNH.INS.23731	EJvN3731	NEPT001–09	GU451324	310
<i>Stigmella birgittae</i>	♀	RMNH.INS.23862	EJvN3862	NEPT007–09	GU451325	665
<i>Stigmella birgittae</i>	♂	RMNH.INS.23864	EJvN3864	NEPT008–09	GU451326	665
<i>Stigmella birgittae</i>	♀	RMNH.INS.23865	EJvN3865	NEPT009–09	GU451327	665
<i>Stigmella xystodes</i>	♂	RMNH.INS.23860	EJvN3860	NEPT005–09	GU451328	665
<i>Acalyptris gielisi</i>	♂	RMNH.INS.23861	EJvN3861	NEPT006–09	GU451315	665
<i>Acalyptris gielisi</i>	♀	RMNH.INS.23940	EJvN3940	NEPT013–09	GU451316	665
<i>Acalyptris psammophrica</i>	♂	RMNH.INS.23732	EJvN3732	NEPT002–09	GU451317	665
<i>Acalyptris psammophrica</i>	♀	RMNH.INS.23846	EJvN3846	NEPT003–09	GU451318	665
<i>Acalyptris psammophrica</i>	♂	RMNH.INS.23866	EJvN3866	NEPT010–09	GU451319	665
<i>Acalyptris psammophrica</i>	♂	RMNH.INS.23868	EJvN3868	NEPT012–09	GU451320	665
<i>Acalyptris psammophrica</i>	♂	RMNH.INS.23982	EJvN3982	NEPT015–09	GU451321	665
<i>Acalyptris repeteki</i>	♂	RMNH.INS.23847	EJvN3847	NEPT004–09	GU451322	665
<i>Acalyptris galinae</i>	♂	RMNH.INS.23981	EJvN3981	NEPT014–09	GU451314	665
<i>Acalyptris</i> sp.	♀	RMNH.INS.23867	EJvN3867	NEPT011–09	GU451323	665
<i>Tischeria ptarmica</i>	♂	RMNH.INS.23733	EJvN3733	TISCH001–09	GU451329	665
<i>Tischeria ptarmica</i>	♀	RMNH.INS.23979	EJvN3979	TISCH002–09	GU451330	665

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Order Lepidoptera, family Tischeriidae

Erik J. van Nieukerken

INTRODUCTION

The Tischeriidae form a small family with about 120 known species, occurring in most continents, but currently not known from Australia (Diškus & Puplesis, 2003a). They are rather small moths, usually less than 10 mm wingspan, and with rather drab colours, ochreous, brown, black, uniform or with some spotting, sometimes metallic. The larvae are invariably leafminers, characterised by the habit of the larva to eject the frass from the mine. The family was recently reviewed and divided into three genera (Diškus & Puplesis, 2003b). Only one species has previously been known from the Arabian Peninsula, *Tischeria omani* Puplesis & Diškus, 2003 (Diškus & Puplesis, 2003b) from northern Oman. This species has not yet been found in the UAE, but could be expected. Here I report another species, new to the Arabian Peninsula and to the UAE.

MATERIALS AND METHODS

Specimens from the UAE are partially deposited in the collection of the National Museum of natural History, Naturalis in Leiden, The Netherlands and partially in the United Arab Emirates Invertebrate Collection. Dry pinned specimens were collected by C. Gielis at light, alcohol preserved specimens were collected in light traps by A. van Harten. Abbreviations and number in square brackets after the number of males and females refer to genitalia slide numbers.

Information on names and distribution of (potential) hostplants has been taken from Jongbloed (2003). Methods for preparation of genitalia, photographs of adults and genitalia and measurements follow those described in van Nieukerken (2007).

SYSTEMATIC ACCOUNT

Tischeria ptarmica Meyrick, 1908

Plates 1–7

Specimens examined: Fujairah, sta 75, 10 m, 1♂ [EJvN3733], 19.iv.2006, leg. C. Gielis. Sharjah Desert Park, 11♂, 2♀ [ethanol material], 25.i–22.ii.2005, in light trap, leg. A. van Harten. Wadi Midaq, sta 77, 460 m, 1♀ [EJvN3979], 20.iv.2006, leg. C. Gielis.

Diagnosis: Male forewing length 2.2 mm, wingspan ca 4.9 mm, antenna with 25 segments. Female forewing length 2.4 mm, wingspan ca 5.3 mm, antenna with 25 segments. Whole insect pale ochreous, forewing and thorax irrorate with few brown and yellow scales. Externally probably not separable from *T. omani*. The male genitalia are characterised by the plate-like extension of the valva, and also otherwise quite distinct from *T. omani*.

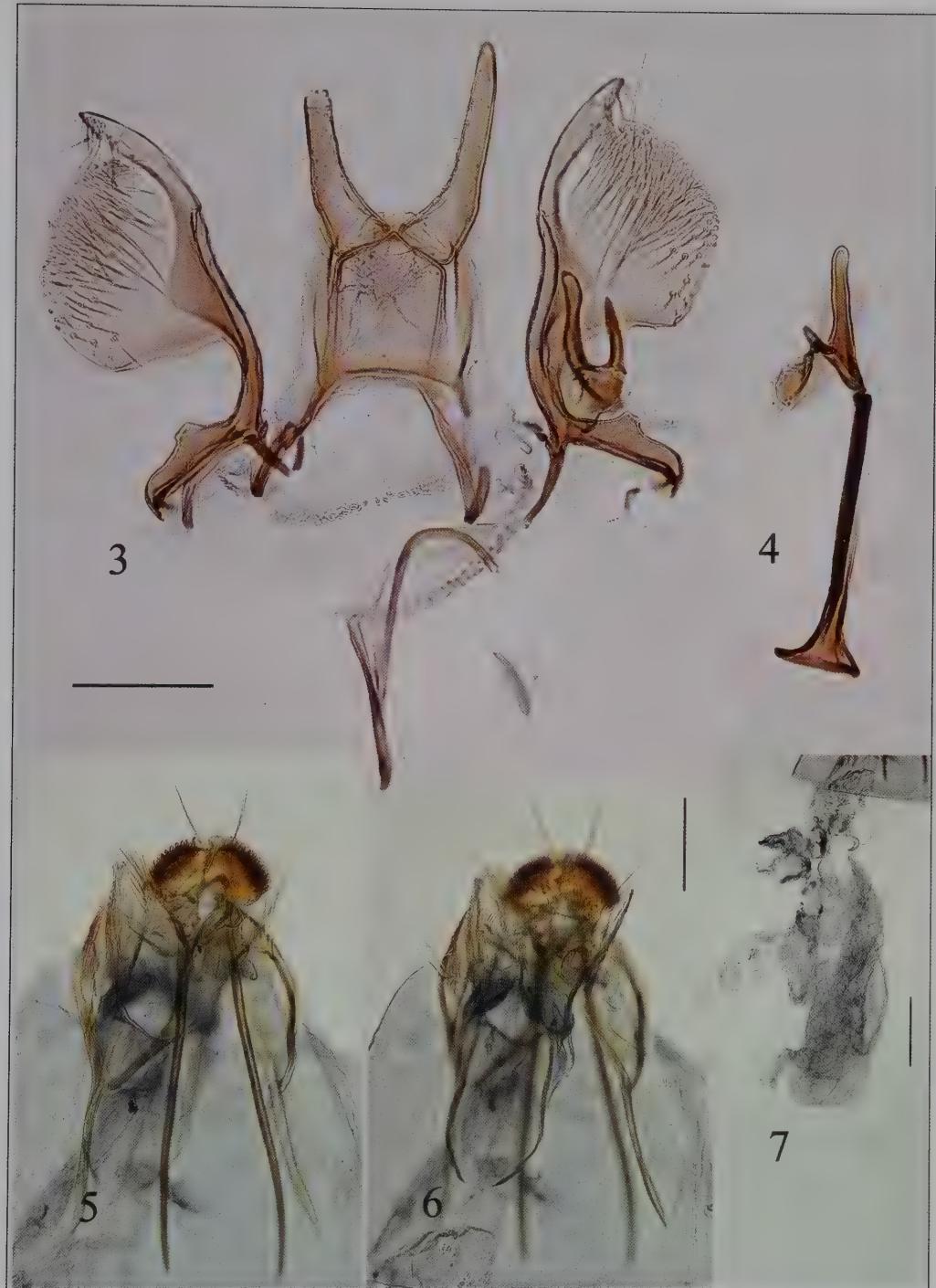
Biology: In India larvae making small elongate blotches on *Ziziphus jujuba*, In Puri, India, it occurred in great profusion (Meyrick, 1908: 399; Fletcher, 1920: 179). It is likely that in the UAE it also feeds on the widespread *Ziziphus spina-christi*.

Remarks: The male genitalia were compared with a drawing of the male lectotype, provided by Jonas R. Stonis (Vilnius). Conspecificity of the male and female of which the genitalia are here depicted is confirmed by the DNA barcode, see Nepticulidae (Pages 491–513 in this volume).

Distribution: Described from India, Orissa: Puri. Here for the first time recorded from the Palaearctic region, the Arabian Peninsula and the UAE.



Plates 1–2. *Tischeria ptarmica* Meyrick. 1: Male; 2: Female.



Plates 3-7. 3-4: *Tischeria ptarmica* Meyrick, male genitalia. 3: Unfolded genitalia; 4: Aedeagus (phallus). 5-7: Female genitalia. 5, 6: Abdominal tip in different focus; 7: Bursa copulatrix. Scale lines 100 μ m (3-6), 200 μ m (7).

ACKNOWLEDGEMENTS

I would like to thank Cees Gielis (Lexmond, Netherlands) and Tony van Harten (Sharjah, UAE) for collecting these tiny moths. Further I would like to thank Jonas R. Stonis (Puplesis) (Vilnius, Lithuania) for providing me with a drawing of the genitalia of the holotype. Camiel Doorenweerd (Naturalis, Netherlands) is acknowledged for molecular analyses.

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Order Lepidoptera, family Stathmopodidae

Sjaak (J. C.) Koster

INTRODUCTION

Stathmopodidae are small to medium-sized moths (wingspan 6–30 mm.) and the wings vary from very narrow and pointed to rather broad. Forewings often with a many-coloured appearance. Head broad and smooth, with a dorsal ridge. Hind tibiae with rows of long brushes. The resting position of many species, with the brushed hind tibiae held aside or even upwards, is very peculiar. The larvae, so far as is known, feed in fruits and flowers, also on sporangia of ferns, or as scavengers or predators in colonies of scale insects. The family Stathmopodidae is with 300+ species mainly represented in the Indo-Australian and Afrotropical regions, less in the Palaearctic region and with only a few species in the New World (Koster & Sinev, 2003). This family has not been recorded from the UAE before. Here four species are recorded, including one new to science.

MATERIALS AND METHODS

The specimens dealt with are partially deposited in the collection of the Nationaal Natuurhistorisch Museum Naturalis of Leiden, The Netherlands (RMNH) and partially in the collection of the United Arab Emirates Invertebrate Collection (UAEIC), without mentioning this explicitly in the text. All specimens were collected at light by J. Buszko and C. Gielis. Watercolours of the adults and line drawings of the genitalia were made by the author.

SYSTEMATIC ACCOUNT

Stathmopoda auriferella (Walker, 1864)

Figure 5

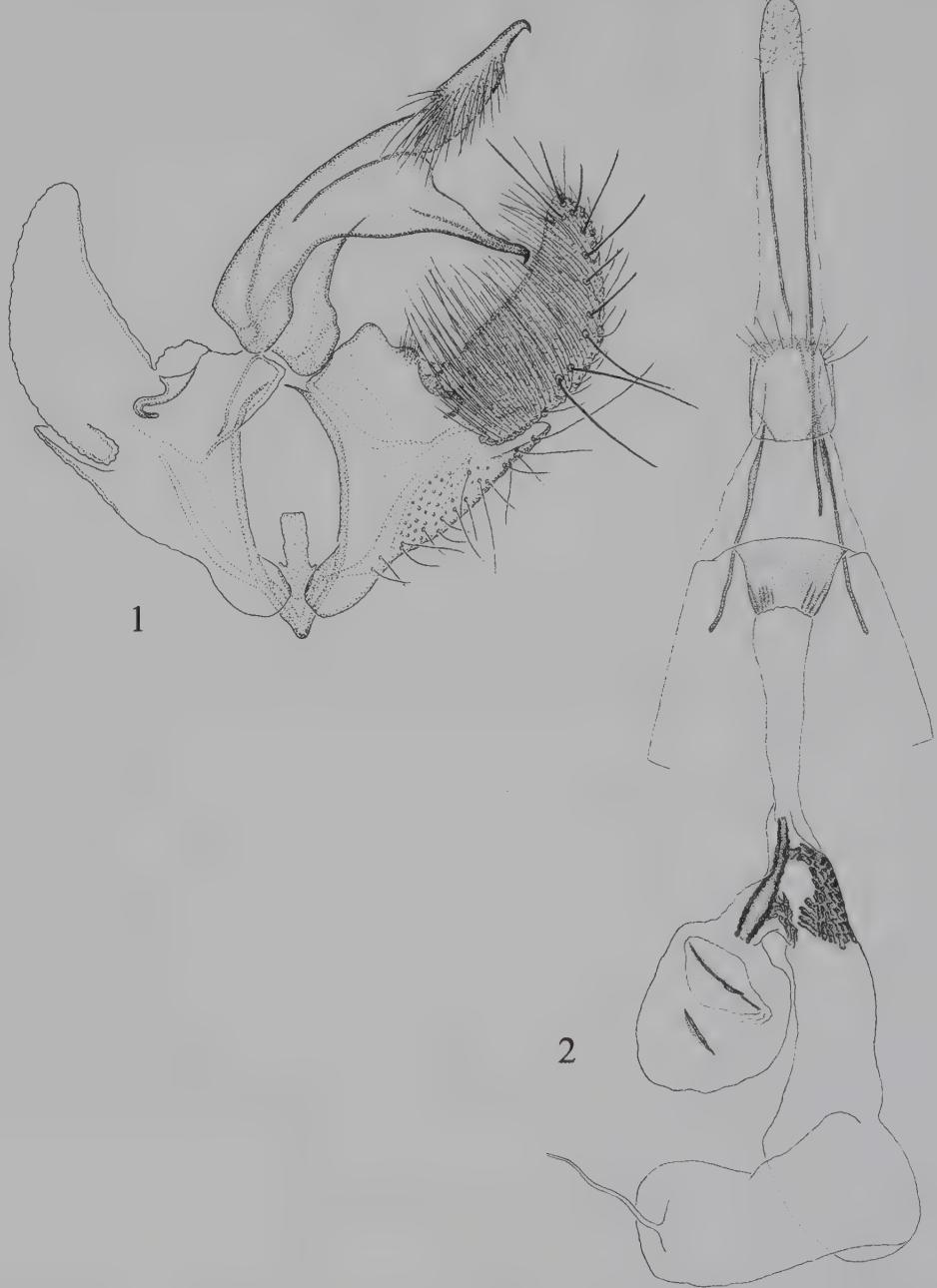
Specimens examined: Al-Ajban, 80 m, 1♀, 12.iii.2006, leg. C. Gielis. Fujairah, 1♀, 5.iv.2006, leg. J. Buszko; 10 m, 1♂, 19.iv.2006, leg. C. Gielis. 7 km N of Fujairah, 1 m, 2♂ [gen. prep. JCK 63127], 10♀ [gen. prep. JCK 6320], 15.iii.2006, leg. C. Gielis; 1♀, 25.iv.2006, leg. C. Gielis; 1♂ [gen. prep. JCK 6321], 1♀, 27.iii.2006, leg. C. Gielis. 5 km S of Huwaylat, 260 m, 1♀, 21.iii.2006, leg. C. Gielis. Sharjah, 10 m, 1♂, 21.iv.2006, leg. C. Gielis. Sharjah Desert Park, 80 m, 1♀, 10.iv.2006, leg. C. Gielis. Diagnosis: Wingspan 10.5–12.5 mm. Thorax dorsally with a broad brown longitudinal streak. Forewing ochreous with a small dark brown costal spot near base, a broad dark brown, slightly inward oblique, fascia before the middle, narrowed in medially, subapical area of apex ochreous-brown. Remarks: The dark brown fascia can vary in width and shape. Larvae in silken galleries among various types of decaying vegetable matter; sometimes recorded from living flowers, seeds, or shoots injured by other invertebrates (Fletcher, 1920; Kasy, 1973; Sinev, 1994).

Distribution: widespread from Afrotropical region, North-Africa, from Middle East eastwards to Japan, Indo-Australian region. New to the UAE.

Stathmopoda fiviora Kasy, 1973

Figures 1–2, 6

Specimens examined: Bithnah, 300 m, 1♀, 15.iv.2006, leg. C. Gielis. 6 km N of Fujairah, 5 m, 1♂, 5.xi.2007, leg. C. & F.K. Gielis. Wadi Maidaq, 460 m, 1♀, 29.iii.2006, leg. C. Gielis; 1♀ [gen. prep. 6331], 1.iv.2006, leg. C. Gielis; 1♂, 1♀, 12.iv.2006, leg. J. Buszko; 1♀, 15.iv.2006, leg. J. Buszko; 1♂, 15.iv.2006, leg. C. Gielis; 1♀ [gen. prep. 6323], 18.iv.2006, leg. C. Gielis; 1♂, 1♀, 29.x.2007, leg. C. & F.K. Gielis



Figures 1–2. *Stathmopoda ficivora* Kasy. 1: Male genitalia, ventrally; 2: Female genitalia.

Diagnosis: Wingspan 10.5–12.5 mm. Thorax shining dark yellow, a broad band in middle and posterior end grey. Forewing shining grey, a small pale yellow spot at base almost connected to costa, an irregular dark yellow spot at one-sixth, narrowing distally and irregularly edged pale yellow on outside and on fold, before one-half a dark yellow streak, almost to costa and dorsum, edged pale yellow on dorsal side, apex of forewing dark yellow from four-fifths.

Remarks: Larvae feed on the fruits of fig (*Ficus carica*) (Kasy, 1973) and can be a pest.

Distribution: Turkmenistan, Nigeria, Namibia, South Africa and probably other areas of Africa and southwest Asia (Sinev, 1988; 2004). New to the UAE.

***Stathmopoda bicolorella* Koster nov. spec.**

Figures 3–4, 7

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Maidaq, 460 m, 25°20'N 56°07'E, 16.iii.2006, leg. C. Gielis, sta. 34; gen. prep. JCK 6318, coll. RMNH. Paratypes: 1♂, same data as holotype; 1♂, same locality but 23.iii.2006, leg. C. Gielis; 1♂, 1.iv.2006, leg. C. Gielis; 2♂, 16.iv.2006, leg. C. Gielis; 1♂, 18.iv.2006, leg. C. Gielis; 1♂, 20.iv.2006, leg. C. Gielis; 2♂, 29.x.2007 leg. C. & F.K. Gielis. 3♂, 6.xi.2007, leg. C. & F.K. Gielis; 1♂, 13.xi.2007, leg. C. & F.K. Gielis. 1♂, Bithnah, 300 m, 15.iv.2006, leg. C. Gielis. 2♂, Wadi Safad, 205 m, 22.ii.2006, leg. C. Gielis.

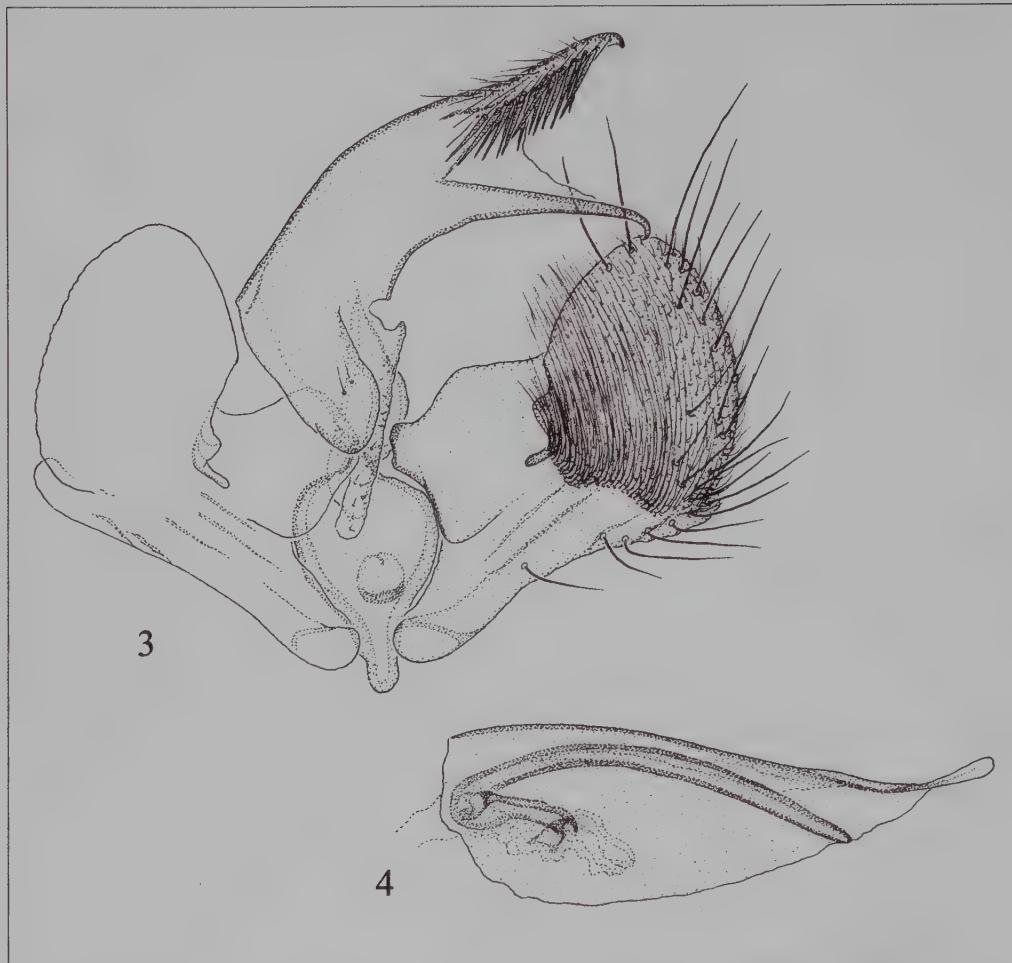
Description: Wingspan 8.5–11 mm. Head: frons shining pale grey with greenish and reddish reflections; vertex, neck tufts and collar shining dark greyish brown with strong golden green reflection; labial palpus shining white, first segment very short, second segment slightly longer than third, third segment ventrally grey; scape and antenna greyish brown with greenish and reddish reflections, antenna anteriorly with short hairs, posteriorly with long hairs, the latter about ten times longer than anterior ones. Thorax and tegulae shining greyish brown with strong greenish and reddish reflections. Legs: dark brownish grey, femora shining white with greenish reflection, tibia midleg with white basal medial and apical rings, tarsal segments white, segment five with dark grey apical ring, tibia hindleg with broad white basal ring and very broad pale golden medial ring, apical half of tarsal segment three, entire segment four and basal half of segment five white, spurs dark grey dorsally, white ventrally. Forewing shining dark yellow, from base to one-fifth, from one-third to beyond one half and apex shining dark greyish brown with greenish and reddish reflections, at three-fifths a shining subcostal streak with reddish reflections, connected to costa by a greyish brown band, and distally connected to a yellowish white costal streak into cilia, a similar coloured, but one and a half times longer subdorsal streak, connected to the dark apical area, cilia dark greyish brown on apex, ochreous-grey towards dorsum. Hindwing shining brownish grey with reddish and greenish gloss, cilia ochreous-grey. Underside: forewing shining dark brownish grey, paler at the yellow sections; hindwing shining greyish white. Abdomen dorsally shining grey, segments two to six banded greyish white posteriorly and anterior of these bands a row of brown spicules, ventrally shining white, anal tuft white.

Male genitalia. Uncus narrow triangular, tip hooked, laterally lined with coarse and fine setae, gnathos similar shaped as uncus, but slightly longer. Tegumen slender and slightly bent. Valvae short, broad and setose, cucullus oval and placed under an angle, sacculus longer than cucullus, outer edge concave, both cucullus and sacculus lined with a series of long and coarse setae. Aedeagus short, gradually tapering to an acuminate apex, vesica with a long and bent cornutus with a short and straight section at base directed in the opposite direction.

Remarks: Biology unknown. The specimens were collected in a complex of dry wadis and valleys surrounded by dry stony mountainous slopes.

Distribution: UAE.

Etymology: The name is derived from the contrasting dark yellow and dark greyish brown wing pattern.



Figures 3–4. *Stathmopoda bicolorella* Koster nov. spec. 3: Male genitalia ventrally; 4: Aedeagus.

***Tortilia pallidella* Kasy, 1973**

Specimens examined: Al-Ajban, 80 m, 1♂, 27.iii.2006, leg. C. Gielis. 5 km S of Huwaylat, 260 m, 3♀ [gen. prep. 6322], 21.iii.2006, leg. C. Gielis. Sharjah, 10 m, 1♂, 11.iv.2006, leg. C. Gielis; 1♂, 27-28.x.2007, leg. C & FK Gielis. Wadi Maidaq, 460 m, 1♀, 29.iii.2006, leg. C. Gielis.

Diagnosis: Wingspan 6–9 mm. Forewing shining pale yellowish grey, a small dark grey costal spot near base, edged underneath to fold by a yellow-orange spot, a semi-circular yellow-orange dorsal blotch reaching, but narrowing, towards fold.

Remarks: Biology unknown.

Distribution: Near and Middle East towards Pakistan (Koster & Sinev, 2003), Tunisia. New to the UAE.

Figure 8



5



6



7



8

Figures 5–8. 5: *Stathmopoda auriferella* (Walker); 6: *Stathmopoda sicivora* Kasy; 7: *Stathmopoda bicolorrella* Koster nov. spec.; 8: *Tortilia pallidella* Kasy.

ACKNOWLEDGEMENTS

I would like to thank Dr. C. Gielis, Lexmond, The Netherlands, for the additional information of the vegetation of the collecting sites.

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Order Lepidoptera, family Coleophoridae

Subfamily Blastobasinae

David Adamski

INTRODUCTION

Although treated as a family through the twentieth century, I follow Hodges (1998) who treated Blastobasidae, sensu Meyrick (1894) as one of four subfamilies within the Coleophoridae. Both Hodges (1998) and Adamski & Brown (1989) agree on the monophyly of the Blastobasinae, and these small to medium-sized moths can be identified by the following combination of characters: forewing with a pterostigma between Sc and R₁, base of CuA₂ approximating a right angle from cubitus, subcubital retinaculum present in female, spiniform setae on abdominal terga 1–8 in male and 1–6 or 1–7 in female, an internal aedeagal sclerite present, valva divided, anellus setose, and eighth sternum platelike in female.

Adamski & Brown (1989) recognized two tribes within the Blastobasinae, Holcocerini and Blastobasini. The Blastobasini to which *Neoblastobasis* belongs can be recognized by the following features: inner surface of dilated first flagellomere of antenna with palmate sex scales in male, vinculum and juxta wide, angle of valva greater than 45°, tergal setae of tegumen present, anellus not fused to juxta, setae on anellus conelike or larger, ovipositor with four membranous subdivisions, ostium closer to segment seven than to segment eight, and signum hornlike. See Adamski & Brown (1989) for a more complete list of blastobasine characters.

Currently, *Neoblastobasis* (Lepidoptera: Gelechioidae: Blastobasini) is a small genus of five species, including the species described herein. *Neoblastobasis* was proposed by Kuznetsov and Sinev (1985), including three species; *N. lativalvella* (type-species), *N. spiniharpella*, and *N. decolor*. Moriuti (1987) later added two species, *Neoblastobasis brevicornis* and *Blastobasis biceratala* Park, 1984.

Neoblastobasis are known from Taiwan, Japan, Korea, north to the southern Maritime Territory of the Federation of Russia, east to India, Sri Lanka, and to the Middle East. Species of *Neoblastobasis* feed on dead leaves and dead insects (Kuznetsov and Sinev, 1985), within acorns of *Quercus serrata* (Fagaceae) (Park, 1984), from refuse in fork of tamarind tree, *Tamarindus indicus* (Fabaceae) and fruits of *Ficus glomerata* (Moraceae), and on stored bulbs of *Allium sativum* (Liliaceae) (Moriuti, 1987).

Neoblastobasis eurotella Adamski nov. spec. is described from an area in the eastern part of United Arab Emirates, which extends from the eastern coastal plain slightly above sea level west to the lower elevations of the Hajar Mountains. The discovery of *N. eurotella* is based upon classical morphological studies, which are corroborated by DNA barcode analysis.

MATERIALS AND METHODS

Morphological observations and measurements of the adult were made using a Leitz RS dissecting microscope with a calibrated micrometer. Genitalia were dissected as described by Clarke (1941) except mercurochrome and chlorazol black were used as stains. The Methuen Handbook of Colour (Kornerup & Wanscher, 1978) was used as a color standard. For scanning electron microscopy, adults specimens were mounted on SEM stubs, and coated with gold-palladium (40/60 %), using a Cressington sputter coater. The features of the adult

head were studied with an Amray 1810 scanning electron microscope at an accelerating voltage of 10 kV. All specimens used for DNA analysis bear a blue "DNA" label. USNM barcode labels on specimens serve for sample identification during DNA sequence analysis and do not imply ownership. Type specimens are deposited in the National Museum of Natural History, Naturalis, Leiden, Netherlands (RMNH), the United States Museum of Natural History, Smithsonian Institution, Washington, D.C., USA (USNM), and the UAE Invertebrate Collection (UAEIC).

Sequences were produced at the University of Guelph, Ontario, Canada. DNA was extracted from the legs of adult specimens and amplified using Qiagen Dneasy Tissue Kit. Primers LepF1 and LepR1 (Hebert et al., 2004) were used to obtain a 659 bp fragment of CO1 with a standard thermocycling regime (Hajibabai et al., 2006). PCR products were subsequently sequenced on an ABI 3730 capillary sequencer. Sequences are available at the NCBI GenBank database (accession numbers FJ998422-FJ998453) and the Barcode of Life Database (BOLD). Neighbor-joining (NJ) trees were generated from the nucleotide sequences as implemented in BOLD (Ratnasingham and Hebert, 2007). Phylogenetic and molecular sequence analyses were conducted using MEGA version 4 (Tamura et al., 2007). Initial species hypotheses were based upon morphology, which were tested against clustering based on DNA. DNA was especially helpful in associating males and females, which exhibit a wide range of overlapping size and pattern differences.

SYSTEMATIC ACCOUNT

Genus *Neoblastobasis* Kuznetzov and Sinev, 1985

***Neoblastobasis eurotella* Adamski nov. spec.**

Plates 1–5, Figures 1–5

Specimens examined: Holotype: ♂, "U[nited] A[rab] E[mirates], Wadi Maidaq, 460 m, 11.iii.2006, 25°20'0"N, 56°7'0"E, leg. C. Gielis, sta 29", "DNA 2007" [blue label], "USNM ENT 00196896" [barcode label], "Genitalia Slide by D. Adamski, No. 5669" [yellow label]. Deposited in RMNH. Paratypes: 17♂, 14♀, same collecting data as holotype. 11♂, 12♀, 5 km S of Huwaylat, 21.iii.2006, leg C. Gielis. 2♀, 7 km N of Fujairah, 15.iii.2006, leg. C. Gielis.

Diagnosis: *Neoblastobasis eurotella* and *N. spiniharpella* Kuznetzov & Sinev, 1985, are similar by sharing a membranous, microtrichiate area at the base of the digitate process of the upper part of the valva and an elongate, spine-like process at the base of the lower part of the valva. However, *N. eurotella* can be distinguished from the latter species by having grayish orange color pattern and absence of the submedian fascia of the forewing, a narrower basal half of the digitate process of the upper part of the valva, a submarginal portion of the lower part of the valva that is acutely curved dorsally, a narrower upturned spine-like process extending from the distal end of the lower part of the valva, and a small ovoid dorsolateral plate within membrane lateral to the ostium.

Description: Head (Plates 2–5). Vertex and frontoclypeus pale grayish orange; labial palpus long, extending slightly beyond vertex in male (Plate 2), more so in female (Plate 3); outer and inner surfaces of labial palpus pale grayish orange, nearly as wide as width of scape in male, and narrower in female; scape and flagellum pale grayish brown; first flagellomere, in male, swollen dorsoposteriorly, forming a budlike process justaposed to a notch between itself and flagellomeres 2–4 (Plate 4), unmodified in female (Plate 3); inner surface of budlike process bearing many overlapping, palmate sex scales (Plate 4); scales with 5–7 digitate processes extending from base (Plate 5); proboscis pale grayish orange.

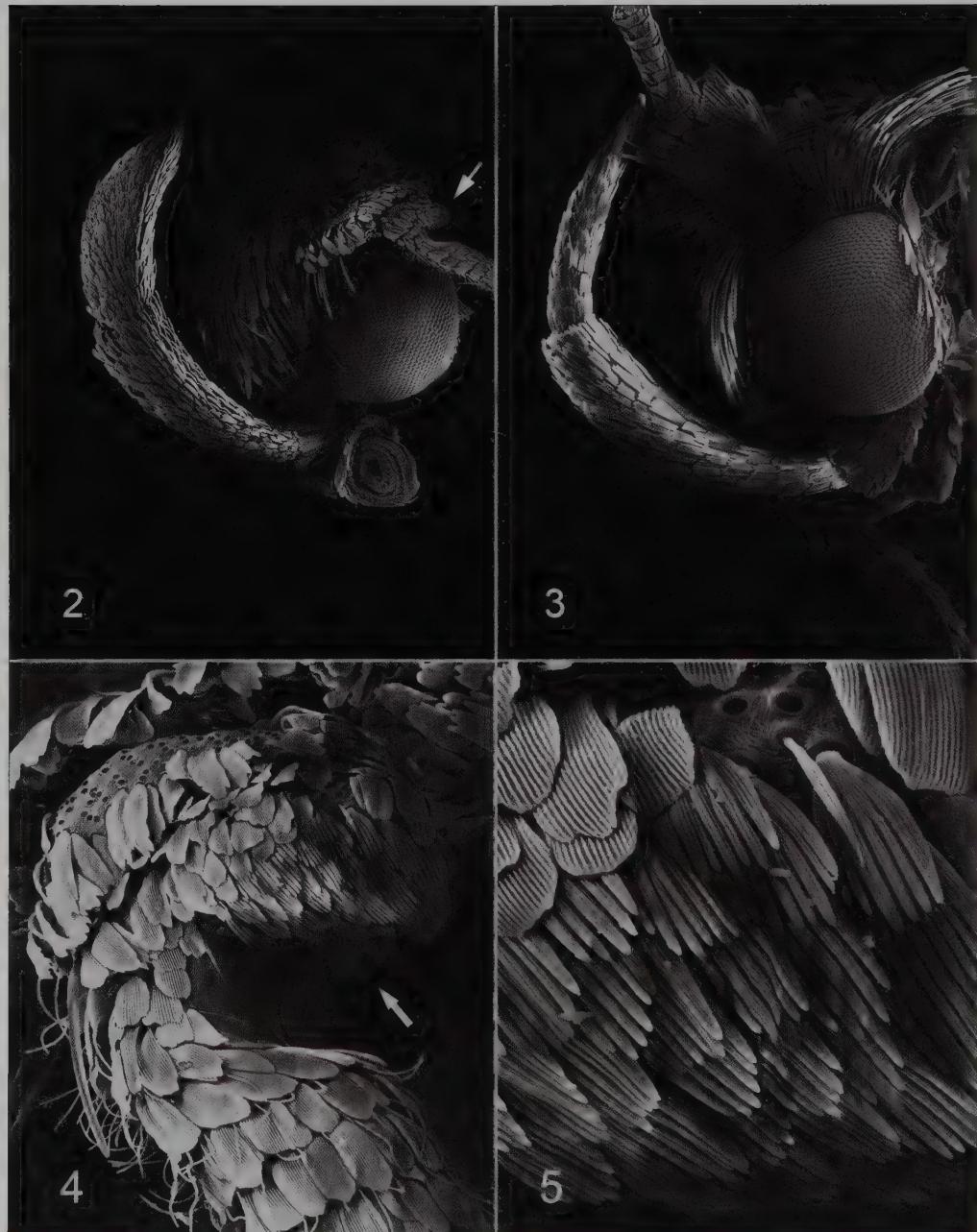
Thorax. Tegula and mesonotum pale grayish orange or with basal 1/2–2/3 brown and distal 1/2–2/3 pale brownish orange. Legs pale grayish orange or brown intermixed with pale



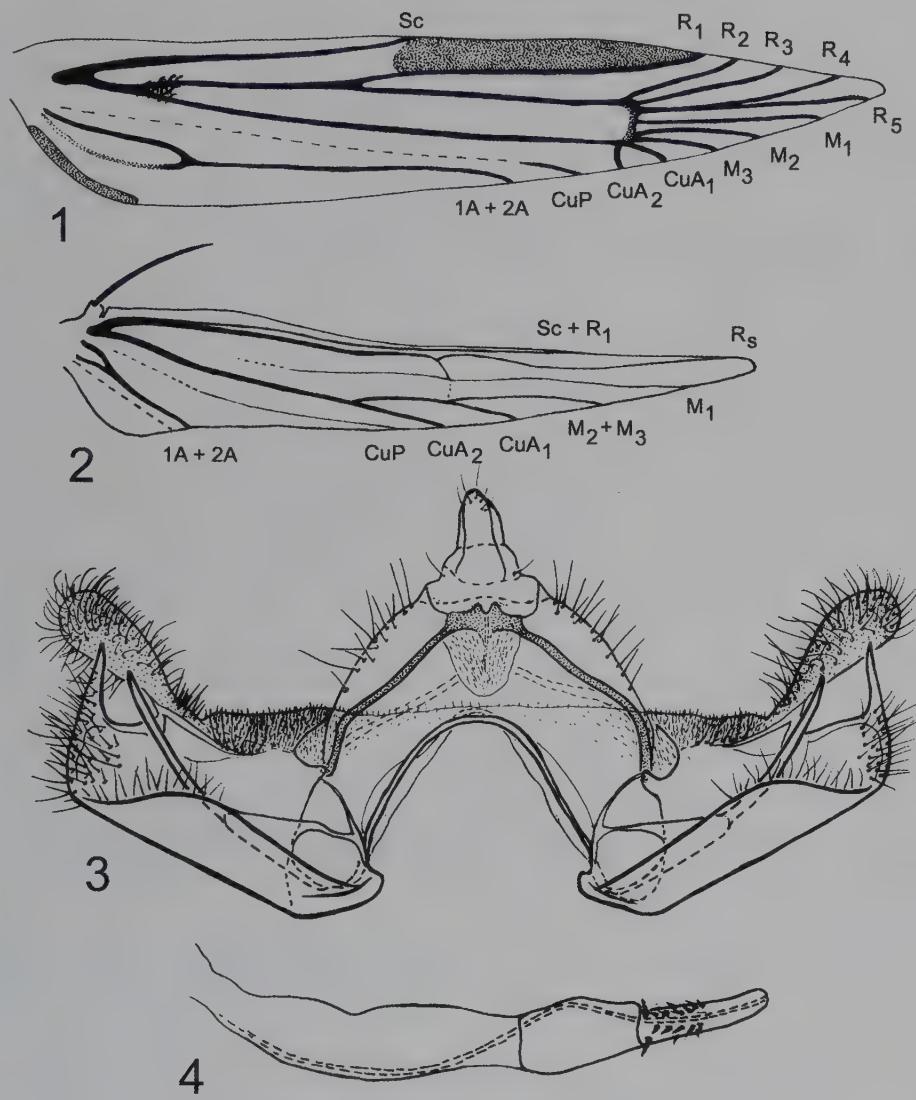
Plate 1. *Neoblastobasis eurotella* Adamski nov. spec. Holotype.

grayish-orange scales along distal margins of all segments and tarsomeres. Forewing (Plate 1). Length 4.8–7.8 mm ($n = 32$) with pterostigma between Sc and R_1 , pale brownish orange with two brown discal spots, one spot near middle and one on distal end near cross-vein or pale brownish orange intermixed with brown scales with discal spots present or absent. Venation (Fig. 1) with M_1 originating equidistant between bases of stem of R_4-R_5 and M_2 ; M_2 broadly arched from base, approximating M_1 near mid-length, and divergent to margin; CuA_2 approximating right angle to cubital vein of cell. Undersurface brown. Hindwing: translucent brownish orange gradually darkening to apex. Venation (Fig. 2) with Rs broadly arched from distal end of $Sc + R_1$ towards M_1 ; cubitus three-branched with $M_2 + M_3$ originating from point near mid-length of CuA_1 ; frenulum with one acanthus in male; three acanthae in female. Abdomen. Male genitalia as in Figures 3–4, uncus subtriangular, slightly curved posterioventrally; sparsely setose; gnathos a narrow plate with a bidentate posterior margin; tegumen wide; tergal setae numerous; vinculum acutely upturned medially; juxta band-like, narrow medially, in same contour as vinculum; valva with a digitate upper part and a broad lower part, tapering into an acutely upturned spine-like process; digitate process setose, flattened, lobelike in appearance, basally overlaid by microtrichiate membrane traversing across diaphragma above aedeagus; ventral submarginal area of lower part of valva acutely curved upwards, overlying basal half of a large, broadly-curved spine-like process; aedeagus slightly longer than valva; sclerite of aedeagus acutely curved slightly beyond base of anellus; anellus with a pair of elongate clusters of cone-like setae and a pair of elongate setae near base.

Female genitalia as in Figure 5. Ovipositor telescopic, with four membranous subdivisions posterior to eighth segment; eighth tergum with a narrow, elongate pigmented marking along median longitudinal axis; a small, ovoid, dorsolateral plate in membrane lateral to ostium; ostium wide, about 1/2 width of seventh sternum; antrum membranous, cup-shaped; posterior margin of seventh sternum nearly straight; seventh tergum with several spine-like setae (if spines are absent their sockets are present); ductus bursae long, about four times as long as



Plates 2–5. *Neoblastobasis eurotella* nov. spec. Head and antenna of male and female with sex scales of male associated with antennal base. 2: Head of male with arrow pointing to antennal notch (lateral view); 3: Head of female (lateral view). 4: Antennal notch. Note arrow pointing to sex scales of male; 5: Male sex scales on inner surface of budlike process of first flagellomere.



Figs 1-4. *Neoblastobasis eurotella* nov. spec. Wing venation and male genitalia. 1: Forewing. 2: Hindwing. 3: Genital capsule. 4: Aedeagus.

corpus bursae; internal wall of anterior fourth of ductus bursae with several rows of spinules; inception of ductus seminalis near anterior end of antrum; posterior end of corpus bursae with a small bull, signum spinelike, with a capitulate base.

Remarks: DNA analysis corroborates the findings based upon morphological analysis, even though a wide range of sizes and patterns was exhibited from the specimens used in this study. The phenogram produced from this analysis can be obtained by a request to the author.

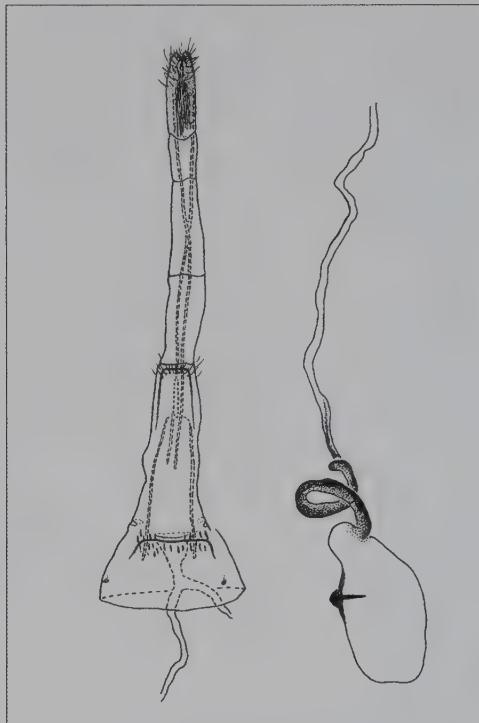


Figure 5. Female genitalia of *Neoblastobasis eurotella* nov. spec.

Distribution: *Neoblastobasis eurotella* is known from an area in the eastern part of the UAE extending from the coastal plain at about one meter elevation west to the lower elevations (from 260-460 meters) of the Hajar Mountains.

Host: Unknown.

Etymology: The species epithet, *eurotella*, is derived from the Greek word, *euro*, meaning eastern, and describes the part of the UAE where *Neoblastobasis eurotella* is known to occur.

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Order Lepidoptera, family Cosmopterigidae

Sjaak (J. C.) Koster

INTRODUCTION

Cosmopterigidae are very small to medium-sized moths (wingspan 5–25 mm.) and the wings vary from rather broad to very narrow. Many of them are often not easy to separate from other families of small moths in the Gelechioidea. The species of the subfamilies Antequerinae and Cosmopteriginae often have a colourful appearance, but the species of the subfamilies Chrysopeleiinae and Scaeosophinae are generally more greyish or blackish coloured. The smaller species are often leaf miners, others are gall-makers, flower, bud, seed, stem or root feeders in a large variety of plants of at least 26 plant families, but some larvae are parasitoids of armoured scale insects (Hodges, 1998). The family Cosmopterigidae has a world-wide distribution, except for the Polar regions and more than 1600 species are known. From this family 17 species are here recognised, two belonging to the subfamily Antequerinae, eight to the subfamily Cosmopteriginae and six to the subfamily Chrysopeleiinae. The family has not been recorded from the UAE before. Here 16 species are recorded including six new to science.

MATERIALS AND METHODS

The specimens dealt with are partially deposited in the collection of the Nationaal Natuurhistorisch Museum Naturalis of Leiden, The Netherlands (RMNH) and partially in the United Arab Emirates Invertebrate Collection (UAEIC), without mentioning this explicitly in the text. All specimens were collected at light by J. Buszko and C. Gielis. Watercolours of the adults and line drawings of the genitalia made by the author.

SYSTEMATIC ACCOUNT

Subfamily Antequerinae Hodges, 1978

Allocrita delozena Meyrick, 1919

Specimens examined: Al-Ajban, 80 m, 2♂, 6.iii.2006, leg. C. Gielis. 5 km N of Ajman, 5 m, 8♂ [gen. prep. JCK 6311], 13.iii.2006, leg. C. Gielis; 18♂, 22.iii.2006, leg. C. Gielis; 2♀, 22.iii.2006, leg. C. Gielis. Fujairah, 2♂, 1♀, 5.iv.2006, leg. J. Buszko. 6 km N of Fujairah, 5 m, 1♀, 5.xi.2007, leg. C. & F.K. Gielis. 7 km N of Fujairah, 1 m, 1♂, 1♀, 15.iii.2006, leg. C. Gielis; 1♂, 1♀, 28.x.2007, leg. C. & F.K. Gielis. 10 km NE of Huwaylat, 1♀, 16.iv.2006, leg. J. Buszko. Al-Jazirat al-Hamra, 0 m, 1♂, 7.xi.2007, leg. C. & F.K. Gielis. 5 km S of al-Jazirat al-Hamra, 5 m, 4♂, 20.iii.2006, leg. C. Gielis; 2♂, 7.iv.2006, leg. C. Gielis. Mahafiz, 75 m, 1♂, 8.iii.2006, leg. C. Gielis. 5 km SE of Mahafiz, 75 m, 1♂, 1♀, 25.iii.2006, leg. C. Gielis. 6 km SE of Mahafiz, 150 m, 1♂, 8.xi.2007, leg. C. & F.K. Gielis. Sharjah, 10 m, 1♂, 26.ii.2006, leg. C. Gielis; 1♀, 1.iii.2006, leg. C. Gielis. Sharjah Desert Park, 80 m, 14♂, 1♀, 9.iii.2006, leg. C. Gielis, gen. prep. JCK 6319; 1♂, 10.iv.2006, leg. J. Buszko; 1♂, 1♀, 4.xi.2007, leg. C. & F.K. Gielis; 1♂, 15.xi.2007, leg. C. & F.K. Gielis. 7 km NE of Um al-Quwain, 0 m, 5♂ gen. [prep. JCK 6310], 4.iii.2006, leg. C. Gielis.

Diagnosis: Wingspan 8–13 mm. The species is characterized by the dark forewing with two white fasciae; a very broad fascia at one-third and a narrow fascia at two-thirds of length of wing.

Figure 1

Remarks: There is quite some variability in the coloration of the forewing. The white fasciae can partly or completely be covered with dark scales or the colour of the forewing is greyish brown instead of blackish brown. Biology unknown.

Distribution: Near and Middle East from Egypt to India (Koster & Sinev, 2003). New to the UAE.

Alloclita cerritella (Riedl, 1993)

Figures 2

Specimens examined: Al-Ajban, 80 m, 4♂ [gen. prep. JCK 7038. 2♀, 1.xi.2007, leg. C. & F.K. Gielis. 6 km N of Ajman, 5 m, 6♀, 30.x.2007, leg. C. & F.K. Gielis. 10 km NE of Huwaylat, 1♀, 17.iv.2006, leg. J. Buszko. Al-Jazirat al-Hamra, 0 m, 2♂, 1♀, 7.xi.2007, leg. C. & F.K. Gielis. 6 km SE of Mahafiz, 150 m, 2♂, 8.xi.2007, leg. C. & F.K. Gielis. Sharjah Desert Park, 80 m, 1♂, 4♀, 4.xi.2007, leg. C. & F.K. Gielis; 1♂, 15.xi.2007, leg. C. & F.K. Gielis.

Diagnosis: Wingspan 9–12 mm. Forewing ochreous brown at base and a similar coloured section on dorsal half from two-fifths to three-fourths, both bordered whitish, apical part grey.

Remarks: The pale sections in the forewing can be darkened almost as dark as the ochreous-brown section, giving the forewing a more dull and less marked appearance.

Biology: Unknown.

Distribution: Known from Saudi Arabia (Riedl, 1993). New to the UAE.

Subfamily **Cosmopteriginae** Heinemann & Wocke, 1876

Cosmopterix crassicervicella Chrétien, 1896

Figures 3, 5–7

Specimens examined: Bithnah, 300 m, 1♂, 15.iv.2006, leg. C. Gielis. Fujairah, 10 m, 1♀, 19.iv.2006, leg. C. Gielis; 5 km S of Huwaylat, 250 m, 2♀ [gen. prep. JCK7039], 11.xi.2007, leg. C. & F.K. Gielis; Wadi Maidaq, 460 m, 2♂, 25.ii.2006, leg. C. Gielis; 2♂, 11.iii.2006, leg. C. Gielis; 3♂, 16.iv.2006, leg. C. Gielis; Wadi Maidaq, 460 m, 3♂ [gen. prep. JCK 6207], 18.iv.2006, leg. C. Gielis; 1♀, 18.iv.2006, leg. C. Gielis; 3♂, 20.iv.2006, leg. C. Gielis.

Diagnosis: Wingspan 8–9 mm. Similar to *Cosmopterix attenuatella* (Walker, 1864) but can be distinguished by the shorter interrupted white line on the antennae, the broader forewings and by the dorsally ochreous to orange yellow coloured segments II–V.

Remarks: The larvae mine the leaves of *Cyperus* spp. (Cyperaceae).

Distribution: Southern Europe, Asia Minor, Caucasus, northern Africa and Near East (Koster & Sinev, 2003). New to the UAE.

Pyroderces wolschrijni Koster & Sinev, 2003

Figure 4

Specimens examined: Wadi Maidaq, 460 m, 1♀, 11.iii.2006, leg. C. Gielis.

Diagnosis: Wingspan 7–11 mm. Forewing reddish brown with a strong outward oblique narrow whitish streak from one-fifth of costa to and beyond fold, broadly edged dark grey, in costal cilia a dark grey V-shaped marking.

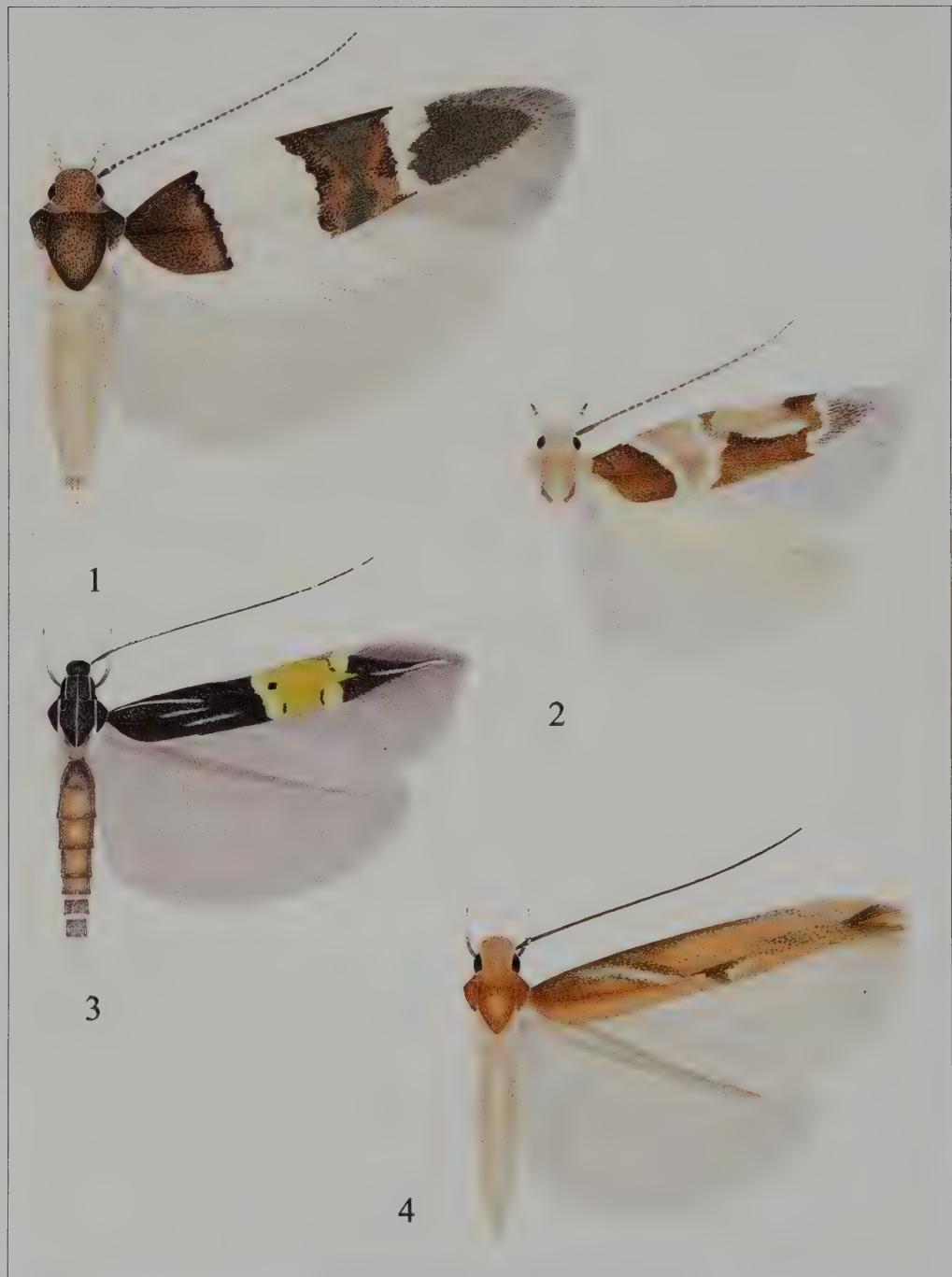
Remarks: Biology unknown. Adults fly in two generations.

Distribution: Described from Spain and Morocco. Further known from Sicily, Malta and Crete.

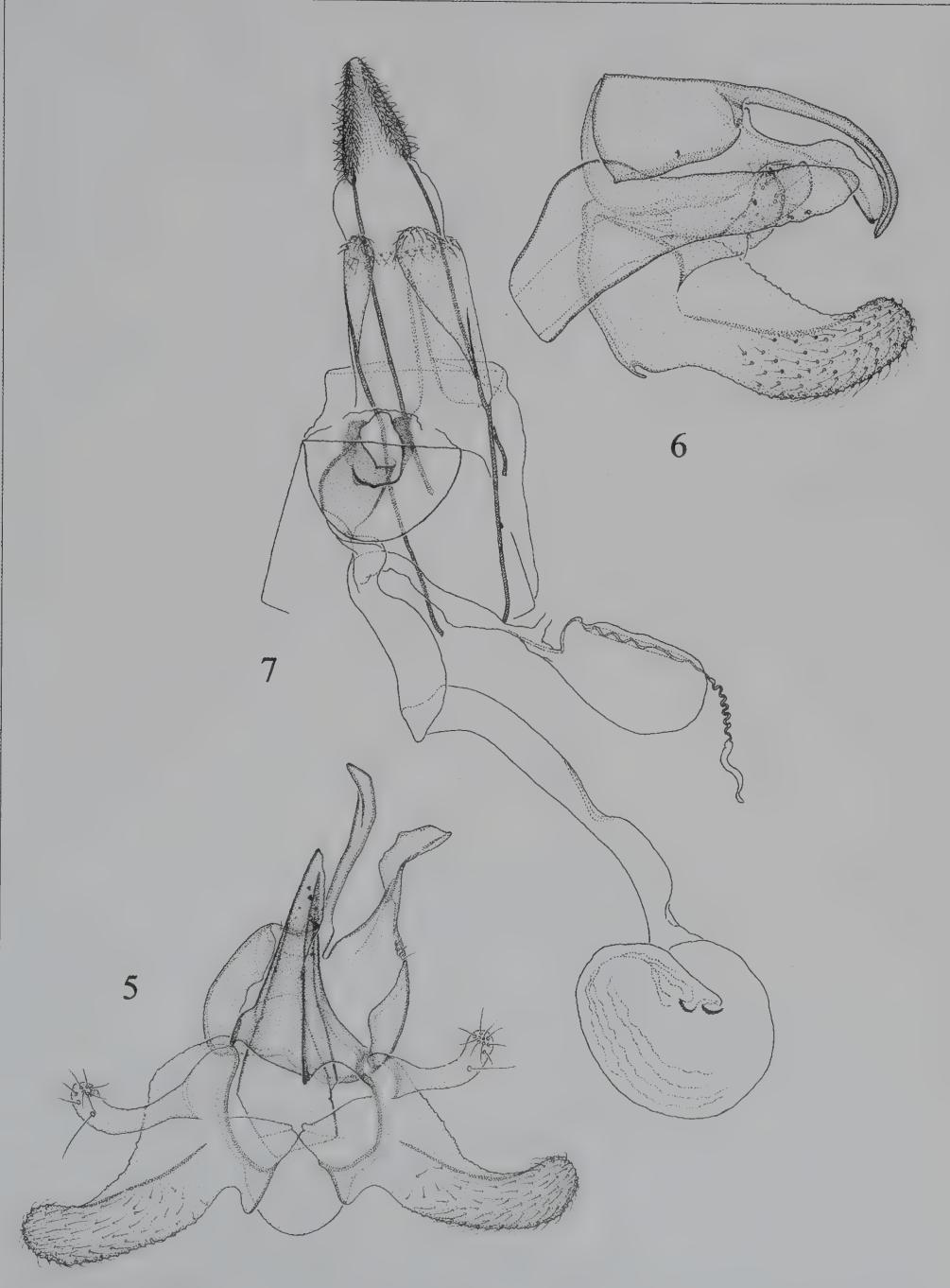
Pyroderces argentata Koster nov. spec.

Figures 8–10

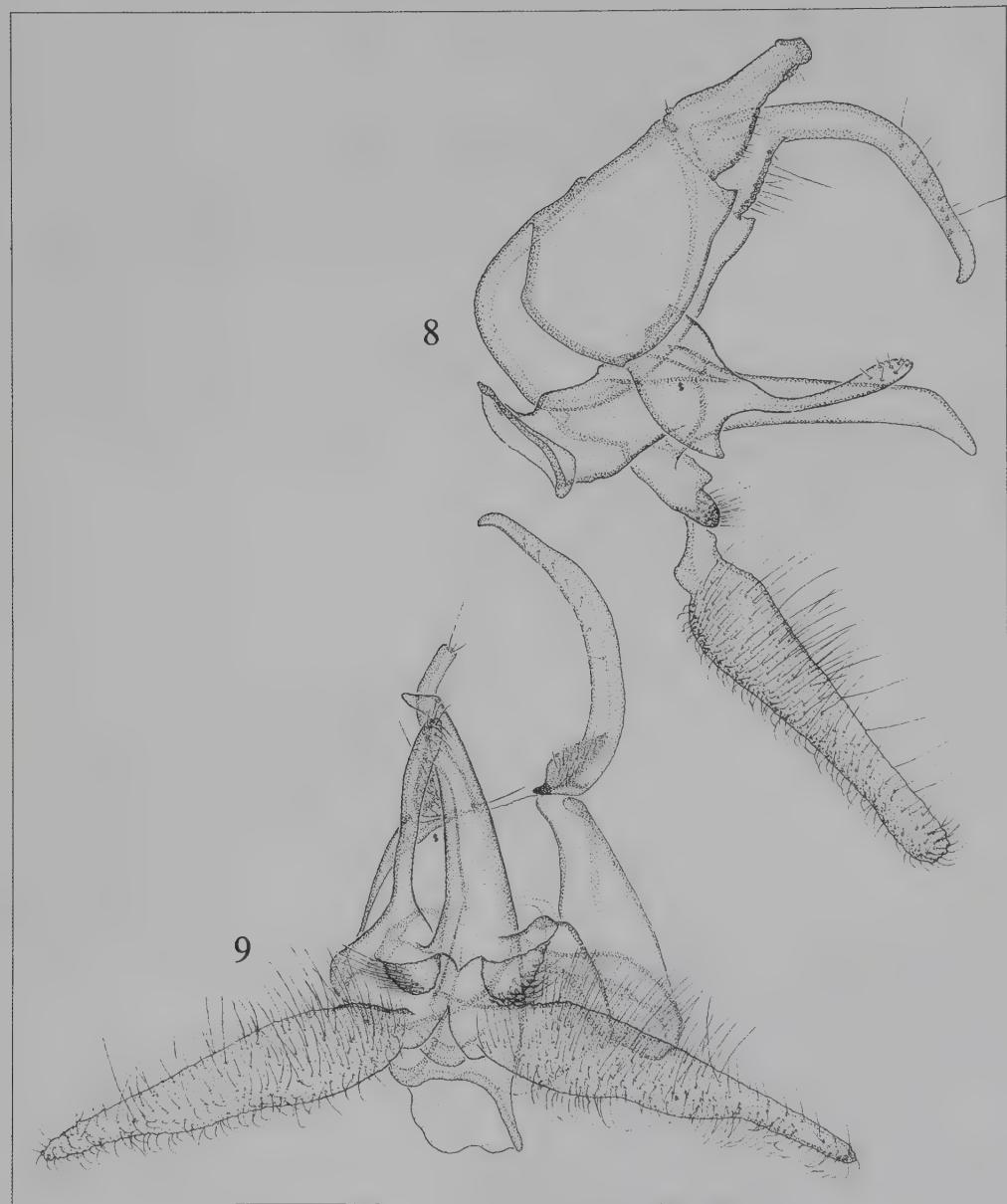
Specimens examined: Holotype: ♂, Bithnah, 300 m, 25°15'N 56°15'E, 15.iv.2006, leg. C. Gielis, sta. 33; gen. prep. JCK 6175, coll. RMNH. Paratypes: 2♂, Wadi Maidaq, 460 m, 12.iv.2006, leg. C. Gielis; 2♂, 16.iv.2006, leg. C. Gielis; 2♂, 18.iv.2006, leg. C. Gielis; 4♂ [gen. prep. JCK 6205], 20.iv.2006, leg. C. Gielis.



Figures 1–4. 1: *Alloclita delozena* Meyrick; 2: *Alloclita cerritella* (Riedl); 3: *Cosmopterix crassicervicella* Chrétien; 4: *Pyroderces wolschrijni* Koster & Sinev.



Figures 5–7. *Alloclita cerritella* (Riedl). 5: Male genitalia, ventrally; 6: Male genitalia, laterally; 7: Female genitalia.



Figures 8–9. *Pyroderces argentata* Koster nov. spec., male genitalia. 8: Laterally; 9: Ventrally.

Diagnosis: Wingspan 9.5–11.5 mm. Head: frons shining grey with greenish and reddish reflections, vertex shining silver grey with ochreous gloss, especially laterally, collar silver grey with reddish gloss; labial palpus orange-brown; first segment very short, second segment four-fifth of the length of the third, ventrally with a row of dark brown scales, third segment dark brown lined laterally on inner and outer surfaces; scape dorsally dark brown with

reddish gloss and white apical ring, ventrally white; antenna ochreous-grey, antenna annulated dark brown till beyond one-half, followed towards apex by five dark brown, five white, five dark brown, five white, five dark brown and five ochreous-white segments at apex. Thorax dark brown with reddish gloss, laterally ochreous-brown, and with a white medial line, this line can be reduced to a posterior white spot, tegulae shining silver grey. Legs: dark grey, tibia foreleg with a white medial spot and white apical ring, tarsal segment one with white basal and apical rings, segment two basal two-thirds white, segment five entirely white, midleg as foreleg except fourth tarsal segment only dark grey at base, tibia hindleg shining dark brown with reddish gloss, and with a subbasal, medial and narrow white apical ring, tarsal segments as midleg, spurs whitish, spurs of hindleg with a dark grey subapical band. Forewing shining dark brown with reddish gloss, costa narrowly edged shining grey, two broad slightly tubercular, silver metallic fascia at one-fourth and one-half, an ochreous-brown streak in costal half from base almost to inner fascia, a narrow silver metallic streak from base to one-eighth in dorsal half, a broad ochreous-brown streak in middle of apical area, accompanied by short silver metallic streaks at costal and dorsal side of basal half, a white streak from ochreous-brown streak into cilia, and a small silver metallic apical streak at tip of wing, cilia dark brown around apex, more ochreous-brown towards dorsum. Hindwing shining silvery grey, darker at costal and dorsal edges. Underside forewing shining brownish grey; hindwing shining pale grey, costal half darker. Abdomen dorsally dark greyish brown, segments posteriorly paler banded, ventrally shining dark grey, segments shining pale grey banded posteriorly, anal tuft white.

Male genitalia. Both brachia of uncus bent inwardly, right brachium more than twice the length of the left one, apex pointed and slightly hooked, left one apex blunt, square. Tegumen wide, asymmetrical, left side shorter than right side. Left anellus lobe wide at base, rather abruptly narrowing to a slightly bent rod, widening distally with rounded apex, right lobe a broad and very short hump. Aedeagus short and wide with a long and gradually tapering manica, tip hooked. Valva straight, narrow, gradually tapering till two-thirds, apex rounded and with rounded setose lobe at base.

Female genitalia. Unknown.

Remarks: Biology unknown. The specimen from Bithnah was collected in the vicinity of a farm situated on eastern dry stony slopes of the mountains. The remaining specimens were collected in Wadi Maidaq, a complex of dry wadis and valleys surrounded by dry stony mountainous slopes.

Distribution: Only known from the UAE.

Etymology: The name is derived from the silvery head, tegulae and markings on the forewings.

Anatrachyntis simplex (Walsingham, 1891)

Figure 11

Specimens examined: Al-Ajban, 80 m, 1♂, 6.iii.2006, leg. C. Gielis. 1♀, Fujairah, 5.iv.2006, leg. J. Buszko; 2♂, 19.iv.2006, leg. C. Gielis. 7 km N of Fujairah, 1 m, 1♂ [gen. prep. JCK 6206], 5♀, 15.iii.2006, leg. C. Gielis; 3♂, 2♀, 5.iv.2006, leg. C. Gielis. Mahafiz, 75 m, 1♂, 8.iii.2006, leg. C. Gielis. Sharjah Desert Park, 80 m, 9♂, 15.xi.2007, leg. C. & F.K. Gielis. Wadi Maidaq, 460 m, 1♀, 12.iv.2006, leg. C. Gielis.

Diagnosis: Wingspan 8–10 mm. Thorax with a white medial streak. Forewing reddish brown with irregular fasciae at one-fourth and one-half and several narrow longitudinal dark lines.

Remarks: Larvae feed on a variety of food as injured seeds, fibre, general debris in cotton bolls, American oil palm (*Elaeis guinensis*) (Aracaceae) and *Eriodendron anfractuosum* (Bombacaceae) (Koster & Sinev, 2003).

Distribution: In the tropics of the Old World and also from Spain, Portugal, Cyprus, Morocco and Egypt (Koster & Sinev, 2003). New to the UAE.

Anatrachyntis vanharteni Koster nov. spec.

Figures 12–15

Specimens examined: Holotype: ♂, 7 km N of Fujairah, 1 m, 25°13'N 56°21'E, 15.iii.2006, leg. C. Gielis, sta. 33; gen. prep. JCK 6332, coll. RMNH. Paratypes: 3♀, same data as holotype, gen. prep. JCK 6335.

Diagnosis: Wingspan 7.5–8 mm. Head. Frons shining white, vertex and neck tufts shining yellowish white with greenish and reddish reflections, collar white; labial palpus white, first segment very short, second segment slightly shorter than third, greyish brown on outside from base to two-thirds, third segment with a blackish brown spot dorsally at base; scape dorsally greyish brown with white apical ring, ventrally white, antenna white, annulated greyish brown till one-half, apical half white, with four greyish brown segments of four or five segments each, apex white. Thorax and tegulae shining yellowish white, irrorated with dark greyish brown scales, except for lateral parts of thorax and posterior parts of tegulae. Legs: foreleg dark brownish grey, inner side and fifth tarsal segment white, midleg white, tibia with dark greyish brown basal, medial and subapical streaks, tarsal segment one with large dark greyish brown medial spot on dorsal side, segment three and segment four in basal half dark greyish brown, hindleg as midleg, but tarsal segments one to four with dark greyish brown dorsal spots, spurs white, dorsally dark greyish brown. Forewing shining yellowish white, strongly irrorated with dark greyish brown scales, in apical half an indistinct, very inward oblique fascia, beyond this an indistinct dark spot, cilia shining yellowish white around apex, irrorated by dark greyish brown scales and a short ciliary line, more greyish white towards dorsum, hindwing shining pale grey, cilia greyish white. Underside: forewing and hindwing shining brownish grey. Abdomen dissected.

Male genitalia. Right brachium of uncus almost straight, apex blunt, length more than half the length of the tegumen; left brachium slender, slightly bent, about half the length of right one. Tegumen long and narrow. Left anellus lobe long and slender, just less than length of tegument, slightly widening in distal third, right lobe very short, square. Valva spatulate, narrowest part just beyond base and upwards bent. Aedeagus very long, slender, narrowing apically, apex rather blunt.

Female genitalia. Papillae anales rounded distally, apophyses posteriors about one and a half time as long as apophyses anteriores. Ostium bursae in pouch-like membrane between sternites VII and VIII. Sterigma irregularly horseshoe-shape with an oval ostium on the left side. Ductus bursae a little longer than corpus bursae. Corpus bursae egg-shaped, lower half granulate with two round dentose signa.

Remarks: Biology unknown. The specimens were collected at light in a former salt marsh with *Salsola* spec. (Amaranthaceae), *Lythospermum* spec. (Boraginaceae) and *Tamarix* spec. (Tamaricaceae), now used as dumping area of the sewage system of the city of Fujairah. This fresh water supply from the sewing system has changed the vegetation and added the following plants species: *Salix* spec. (Salicaceae), *Cistus* spec. (Cistaceae), grasses and bamboos (Gramineae), *Acacia* spp. (Fabaceae) and *Aster* spec. (Compositae).

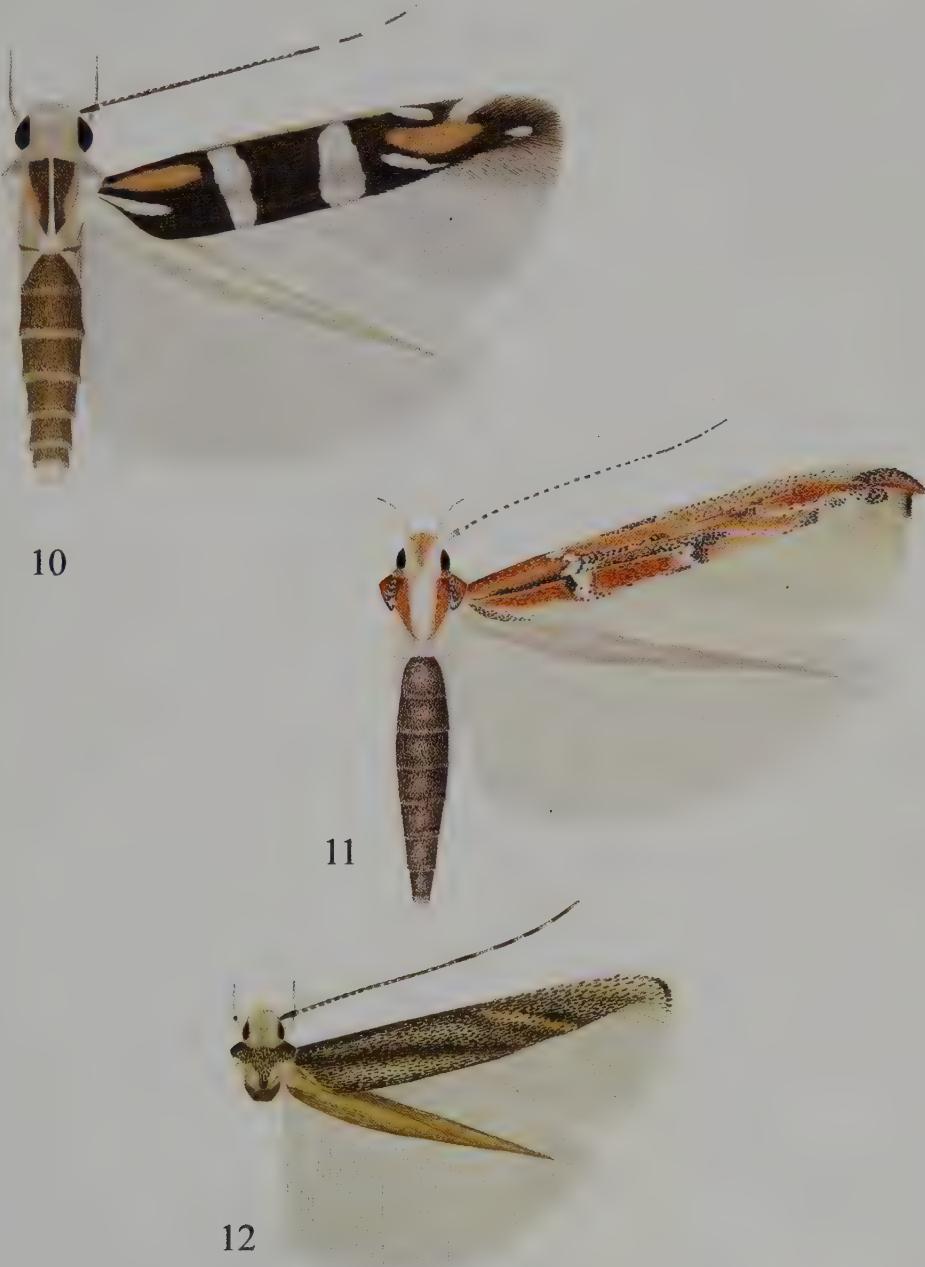
Distribution: Only known from the type-locality.

Etymology: The new species is named after Antonius van Harten, the Dutch scientist in tropical agriculture who is the editor of this series.

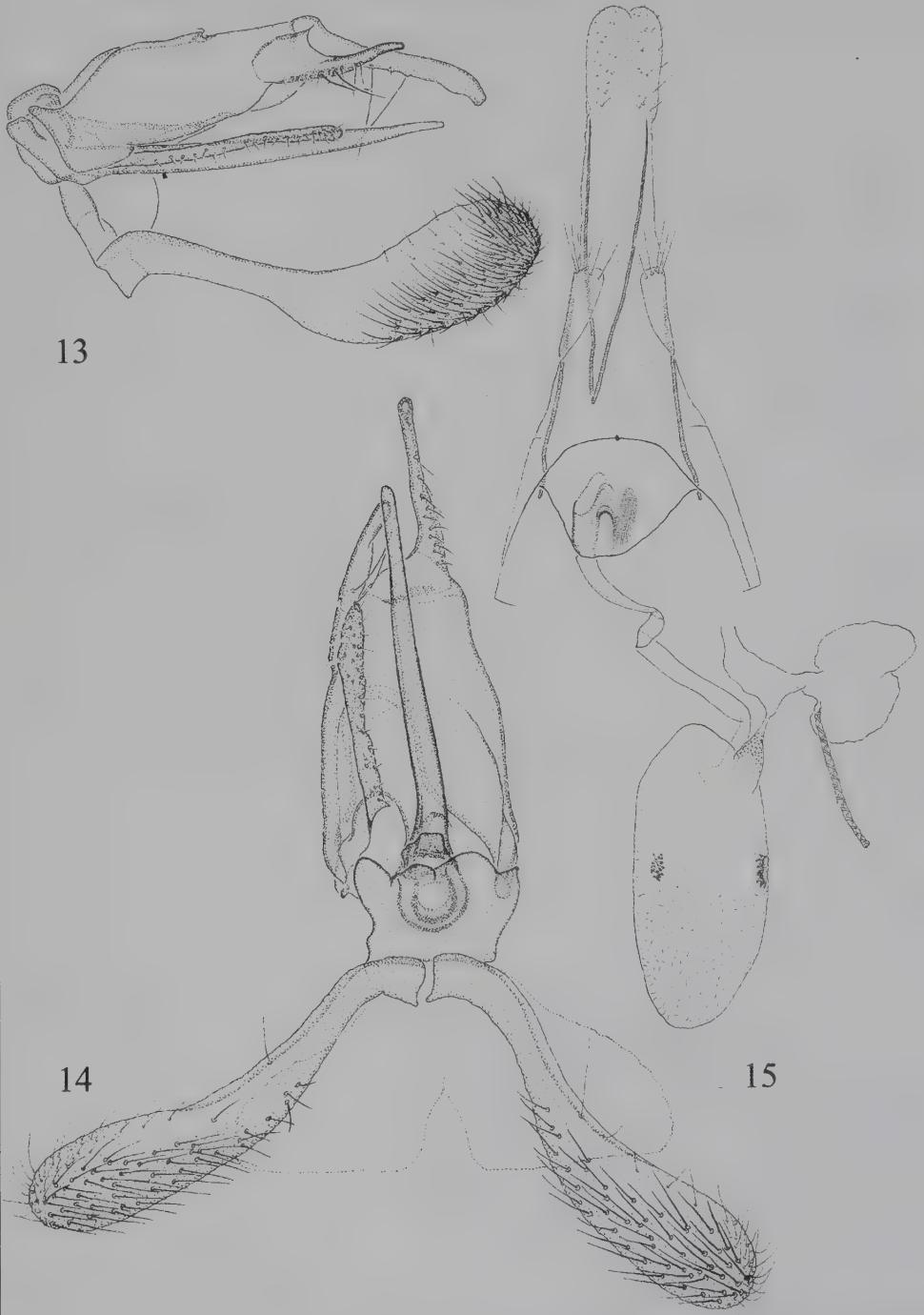
Coccidiphila nivea Koster nov. spec.

Figures 16, 18

Specimens examined: Holotype: ♂, 14 km E of ad-Dhaid, 185 m, 25°12'N 56°0'E, 9.iv.2006, leg. C. Gielis, sta. 58, gen. prep. JCK 7086, coll. RMNH. Paratypes: 1♂, 5 km S of Huwaylat, 260 m,



Figures 10–12. 10: *Pyroderces argentata* Koster nov. spec.; 11: *Anatrachyntis simplex* (Walsingham); 12: *Anatrachyntis vanharteni* Koster nov. spec.



Figures 13–15. *Anatrachynitis vanharteni* Koster nov. spec. 13: Male genitalia, laterally; 14: Male genitalia, ventrally; 15: Female genitalia.

21.iii.2006, leg. C. Gielis. 1♂ [gen. prep. Wf 9870], Mahafiz, 75 m, 8.iii.2006, leg. C. Gielis. 1♂, Sharjah, 10 m, 10.iii.2006, leg. C. Gielis.

Diagnosis: Male. Wingspan 8.5 mm. Head. Frons, vertex shining white, neck tufts shining white, sometimes greyish tinged in middle, collar white, mixed grey; labial palpus white, first segment very short, greyish brown on outside, second segment one and a half times longer than third, basal half on outside greyish brown, third segment greyish brown on outside in basal third; scape white to brownish grey with white apical ring, ventrally white, antenna ochreous-white, sometimes indistinctly annulated ochreous, before apex three dark brown streaks of four segments separated by five ochreous-white segments, apex ochreous-white. Thorax shining white, irrorated with dark greyish brown scales in anterior third, tegulae shining white, anteriorly dark greyish brown. Legs. Foreleg dark brownish grey, inner side tibia and first tarsal segment white, tarsal segments one and two with white apical rings, segment five entirely white, midleg white, tibia with very oblique dark greyish brown medial streak, tarsal segment one with large dark greyish brown medial spot on dorsal side, segment two dark greyish brown in apical half, segments three and four dark greyish brown, hindleg as midleg, spurs white. Forewing shining white, a broad dark greyish brown costal streak from base to two-fifths, after this subcostally to two-third, a narrow dark greyish brown subdorsal streak from base to beyond one-half, often interrupted, an irregular and narrow dark greyish brown streak in middle of apical third, sometimes inwardly connected to costal streak, into cilia, cilia shining white with a short ciliary line dorsal of dark greyish brown streak at apex, Hindwing shining greyish white, cilia shining white. Underside: forewing brownish grey, on costa dark brownish grey, dark streak in cilia distinctly visible, hindwing shining greyish white. Abdomen dorsally, ventrally and anal tuft shining white.

Male genitalia. Right and left brachium fused to a broad uncus, the right brachium still recognisable with a hooked tip, left one only recognisable as a sclerotized ridge. Tegumen slender and rather long. Anellus lobes long and slender, bent in middle. Valvae from narrowest in middle gradually widening into a triangular, distally rounded, cucullus. Aedeagus short, tubular, wider at base, downwards bent, coecum with two tongue-shaped protrusions.

Remarks: Biology unknown. With the fused brachia of uncus and the rather narrow aedeagus the species differs in the male genitalia from the *Coccidiophila*-species in the south of Europe. The specimen from Mahafiz was collected in a dry wadi in a sand desert with *Acacia* spp. (Fabaceae), *Euphorbia* spec. (Euphorbiaceae), and after rain showers low vegetation of crucifers (Brassicaceae). The specimen from Sharjah was collected in a garden in the middle of the town. The specimen from Huwaylat was collected near a farm situated on dry stony mountainous slopes. The specimen of ad-Dhaid was collected on the spurs of rubble slopes in the desert with a vegetation of many *Acacia* spp. (Fabaceae), *Euphorbia* spec. (Euphorbiaceae), and some grasses (Graminae).

Distribution: UAE.

Etymology: The name is derived from the white head and basal colour of the forewing.

Eteobalea sumptuosella (Lederer, 1855)

Specimens examined: Wadi Maidaq, 460 m, 1♂ [gen. prep. JCK 6176], 16.iv.2006, leg. C. Gielis.

Diagnosis: Wingspan 13–20 mm. The white costal spots and the tubercular pale golden markings on the forewing are characteristic for several species of the genus *Eteobalea* Hodges, 1962. Certain identification only possible by the examination of the genitalia.

Remarks: Biology unknown. So far the known flight times were from early June till early October.

Figure 19

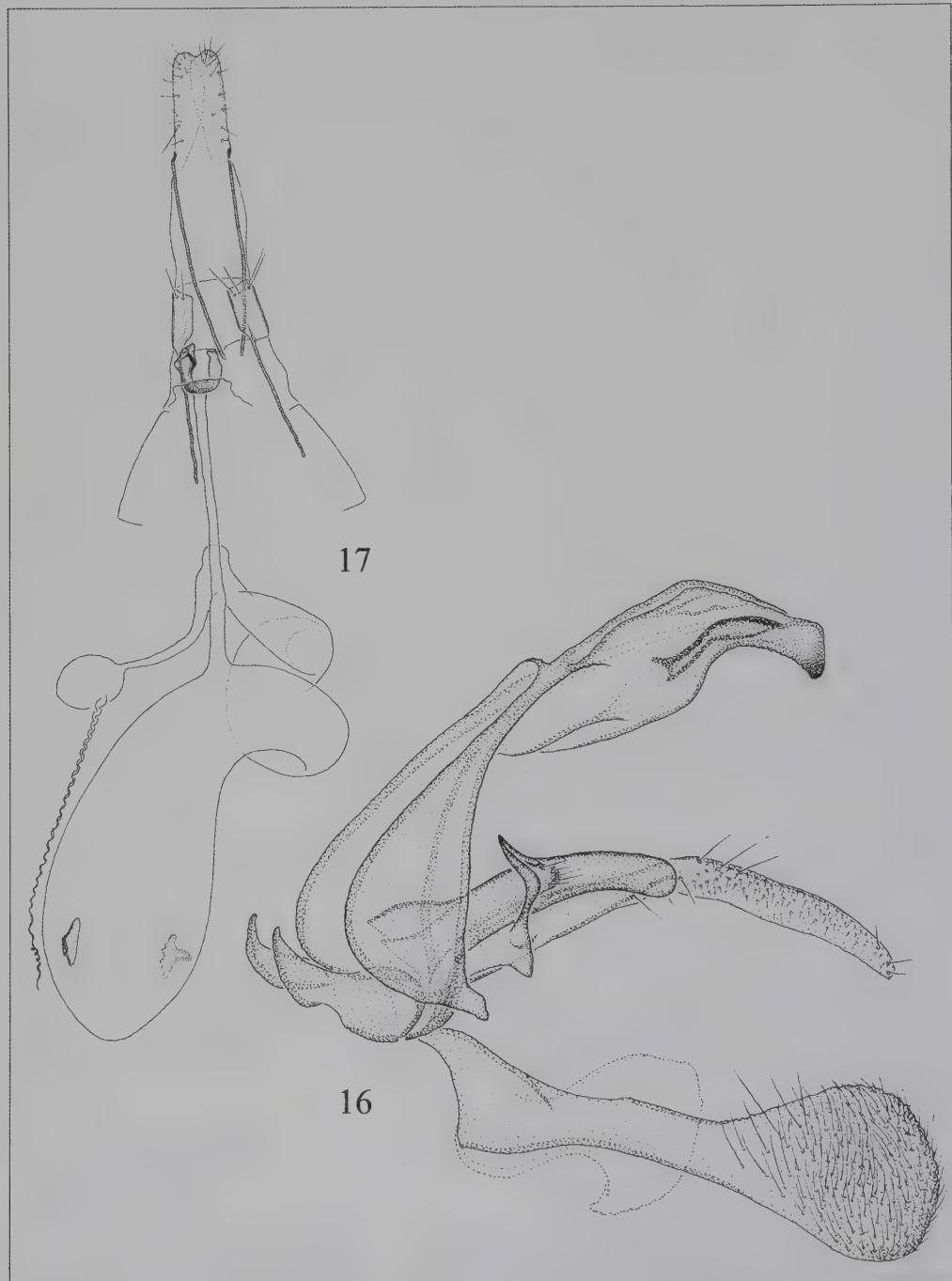


Figure 16–17. 16: *Coccidiphila nivea* Koster nov. spec., male genitalia, laterally. 17: *Eteobalea* spec., female genitalia.

Distribution: Mediterranean area, eastwards to Asia Minor, the Caucasus, Near East to Central Asia (Koster & Sinev, 2003). New to the UAE.

Eteobalea spec.

Figures 17, 20

Specimens examined: 5 km S of Huwaylat, 250 m, 1♀ [gen. prep. JCK 7041], 11.xi.2007, leg. C. & F.K. Gielis.

Diagnosis: Wingspan 7.6 mm. Head. Frons pale grey, laterally lined white, vertex, neck tufts shining ochreous-brown, laterally lined white, collar shining dark brown; labial palpus first segment very short, white, second segment three-fourths of the length of the third, ochreous-brown on outside, white on inside with a ochreous-brown subapical and a white apical ring, third segment dark brown, dorsally and ventrally lined white; scape dorsally shining dark brown with white anterior and posterior lines and white apical spot, ventrally white; antenna shining dark brown, basal part to beyond one-half annulated, followed by one white, seven dark brown, one white, seven dark brown, one white, six dark brown, two white and two dark brown segments at apex. Thorax and tegulae shining dark brown with golden gloss, tegulae posteriorly edged silver metallic. Legs: shining dark brown, tibiae of mid and hindleg shining white, tibia foreleg with two short longitudinal white lines and a white apical ring, tarsal segment one with basal and apical white rings, segment two with white basal ring, segment five entirely white, tibia midleg with white basal, medial and apical rings, tarsal segments as foreleg, tibia hindleg as midleg, tarsal segment one with white basal and apical rings, segments two and three with white apical rings, segments four and five entirely white. Forewing shining dark brown with golden reflection, on costa, at one-sixth an incomplete outward oblique tubercular silver metallic fascia, interrupted on fold, five silver metallic tubercular spots, three subcostally, first at one-third, connected to costa by a white spot, a similar, but little smaller, spot at three-fourths with a small rounded spot in between, one subdorsal spot in fold before one-half and a second, but larger, spot on dorsum at two-thirds, around apex several silver metallic streaks with strong greenish and purplish reflections, a ciliary line around apex; cilia dark brownish grey around apex, more ochreous-grey towards dorsum. Hindwing shining brownish grey, cilia ochreous-grey. Underside: forewing shining pale ochreous-grey, white streak of second costal distinctly visible, hindwing shining pale ochreous-grey. Abdomen dorsally with segments one to four yellowish grey, remaining segments brownish grey, segments two to six narrowly banded paler posteriorly, ventrally dark grey, segments broadly shining white banded posteriorly, anal tuft yellowish white.

Male genitalia. Unknown.

Female genitalia. Segment VIII short, wider than long. Ostium circular, sterigma lerge, strongly sclerotized, horseshoe-shaped, left wall a little longer than right one, wider and with sclerotized ridges. Ductus bursae about three-fourths of length of corpus bursae. Corpus bursae posteriorly narrowed and with a long and coiled, gradually tapering, extension, two fan-shaped signa.

Remarks: Biology unknown. Despite the very small wingspan the species does not belong to *Vulcaniella* Riedl, 1965, according to the shape of the sterigma, the lack of the sclerotization at the posterior edge of sternite VII and by the shape of the tergal apodemes.

The specimen was collected near a farm situated on dry stony mountainous slopes.

Distribution: UAE.

Subfamily **Chrysopeleiinae** Mosher, 1916



Figures 18–20. 18: *Coccidiphila nivea* Koster nov. spec.; 19: *Eteobalea sumptuosella* (Lederer); 20: *Eteobalea* spec.

Ascalenia (Semetria) callynella Kasy, 1968

Figures 21, 23

Specimens examined: Al-Ajban, 80 m, 1♂ [gen. prep. JCK 6316], 27.iii.2006, leg. C. Gielis. 14 km E of ad-Dhaid, 185 m, 1♂ [gen. prep. JCK 6315], 9.iv.2006, leg. C. Gielis.

Diagnosis: Wingspan 7–9 mm. Forewing shining dark brownish grey, more or less mottled by pale grey tipped scales, an indistinct pale grey spot in fold at two-fifths, and at two-thirds an indistinct zigzag fascia from costa to dorsum, Hindwing in male from beyond base to beyond one-half covered with coarse dark brownish grey scales with some bluish reflection.

Remarks: Larvae probably on *Tamarix* spec. (Tamaricaceae) (Kasy, 1975).

Distribution: Egypt, Israel, Iran (Kasy, 1974; Riedl, 1996). New to the UAE.

Ascalenia (Ascalenia) kairaella Kasy, 1969

Figures 22, 24

Specimens examined: Sharjah, 10 m, 1♀ [gen. prep. JCK 6317], 10.iii.2006, leg. C. Gielis.

Diagnosis: Wingspan 5–8 mm. Forewing shining greyish brown, more or less mottled by pale grey tipped scales, especially near costa and apex, base dorsally edged ochreous-brown, four very indistinct darker arrow-like spots, surrounded by paler scales.

Remarks: Biology unknown.

Distribution: India, Iran (Kasy, 1974). New to the UAE.

Pseudascalenia riadella Kasy, 1968

Figures 25–27

Specimens examined: 14 km E of ad-Dhaid, 1♂ [gen. prep. JCK 7051], 8♀, 9.iv.2006, leg. J. Buszko. Wadi Maidaq, 460 m, 2♀, 2.iii.2006, leg. C. Gielis; 3♂ [gen. prep. Geadike 5483], 9♀, 16.iii.2006, leg. C. Gielis; 1♂ [gen. prep. Geadike 5485], 23.iii.2006, leg. C. Gielis; 2♀, 23.iii.2006, leg. C. Gielis; 1♀, 27.iii.2006, leg. C. Gielis; 2♂, 2♀, 29.iii.2006, leg. C. Gielis; 2♂, 5♀, 9.iv.2006, leg. C. Gielis; 1♀ [gen. prep. Geadike 5484], 12.iv.2006, leg. C. Gielis.

Diagnosis: Wingspan 5–8 mm. Forewing shining dark brownish grey, more or less mottled by pale grey tipped scales, especially near costa and apex, a very indistinct darker arrow-like spot, followed by paler scales, in fold.

Remarks: Biology unknown.

Distribution: Egypt, Saudi Arabia (Kasy, 1968). New to the UAE.

Bifascioides leucomelanellus (Rebel, 1917)

Figure 28

Specimens examined: Wadi Maidaq, 460 m, 1♀, 1.iv.2006, leg. C. Gielis.

Diagnosis: Wingspan 6.5–7 mm. Forewing shining dark brown, two broad yellowish-white fasciae, first near base, broad at dorsum and abruptly narrowing at costa, second at two-third, both edged irregular and narrowing towards dorsum.

Remarks: Biology unknown.

Distribution: Iran, Saudi Arabia, Egypt, Libya, Malta (Riedl, 1993; Koster & Sinev, 2003). New to the UAE.

Gisilia sclerodes (Meyrick, 1909)

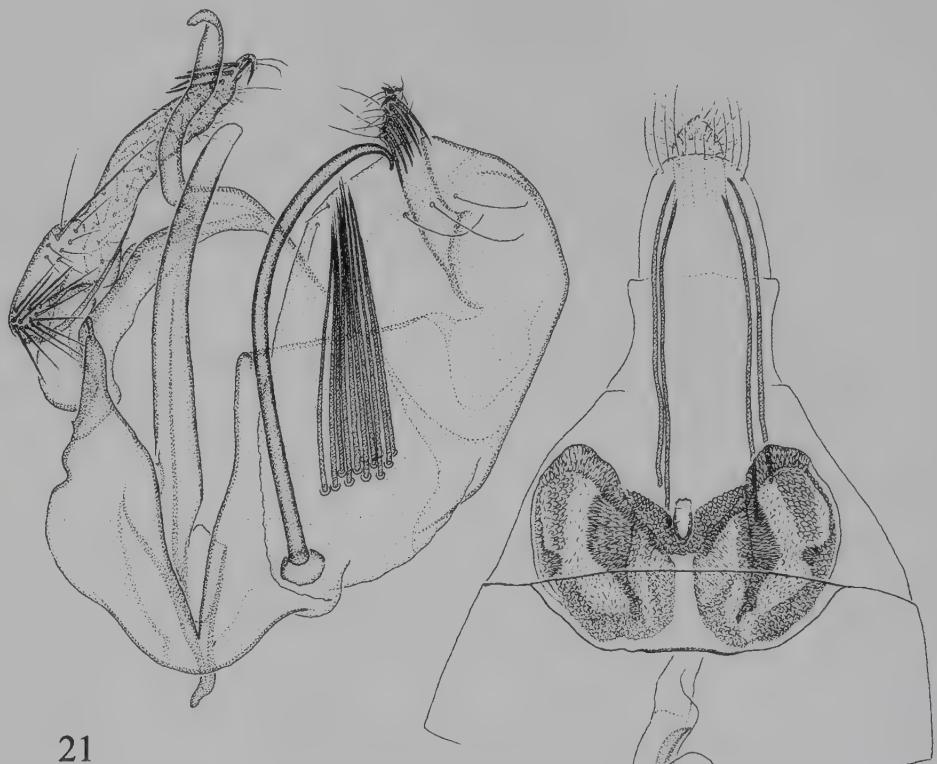
Figures 29, 31

Specimens examined: Wadi Maidaq, 425 m, 1♀ [gen. prep. JCK 7040], 29.x.2007, leg. C. & F.K. Gielis.

Diagnosis: Wingspan 8 mm. Forewing shining dark brownish grey with purplish gloss, two yellowish white fasciae, inner near base and strongly narrowing at costa, outer beyond one-half, slightly narrower than inner and narrowing to costa and dorsum, at four-fifths a yellowish white costal spot to middle of wing, a small and indistinct, strongly dark grey irrorated, spot on tornus, opposite of costal spot.

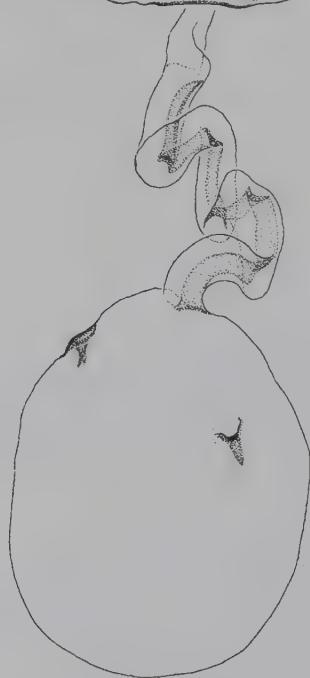
Remarks: Larvae on *Acacia nilotica* and *A. arabica* (Fabaceae) (Sinev, 2007).

Distribution: South Africa, Namibia, DR Congo, Nigeria, Kenya, Sudan, Egypt (Sinev, 2007). New to the UAE.

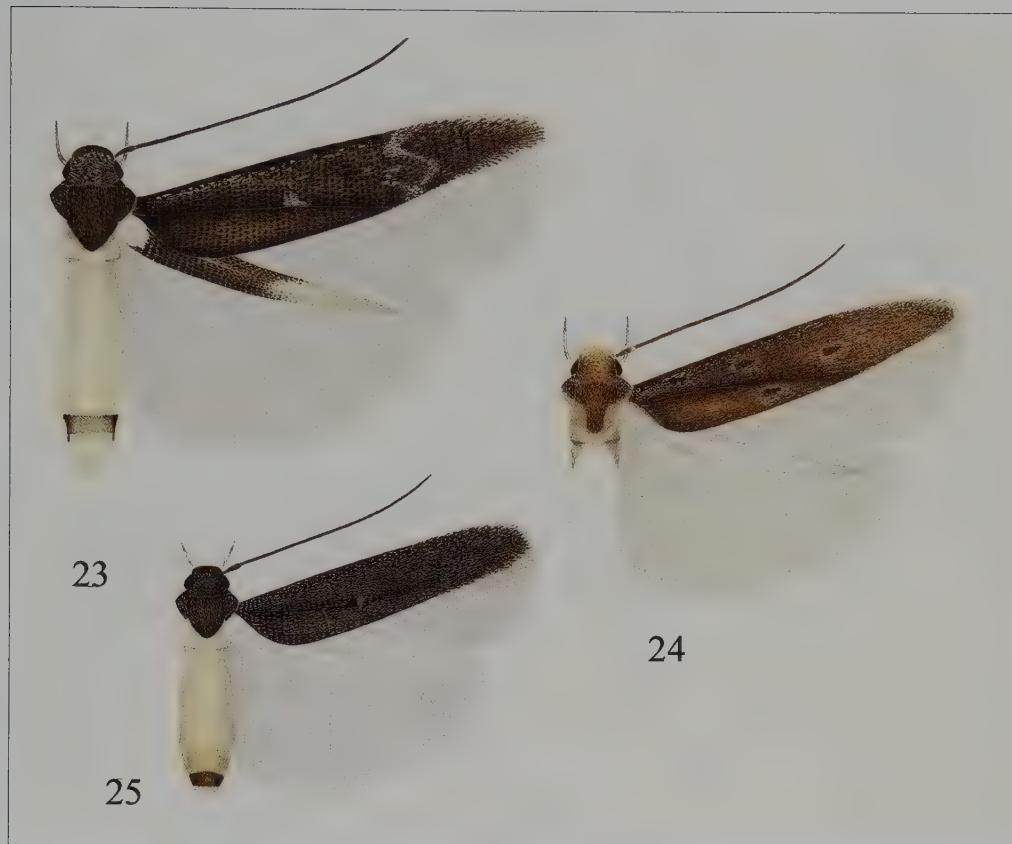


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22



Figures 21–22. 21: *Ascalenia (Semetria) callynella* Kasy, male genitalia, laterally; 22: *Ascalenia (Ascalenia) kairaella* Kasy, female genitalia.



Figures 23–25. 23: *Ascalenia (Semetria) callynella* Kasy; 24: *Ascalenia (Ascalenia) kairaella* Kasy; 25: *Pseudascalenia riadella* Kasy.

***Gisilia gielisi* Koster nov. spec.**

Figures 30, 32

Specimens examined: Holotype: ♂, Sharjah, 10 m, 25°21'N 55°24'E, 24–26.iv.2006, leg. C. Gielis, sta. 83, gen. prep. JCK 6314, coll. RMNH.

Diagnosis: Wingspan 8 mm. Head. Frons shining greyish white, vertex shining dark grey, laterally paler, neck tufts shining dark grey, laterally shining dark brown, collar shining dark brown; labial palpus first segment very short, dark brown, second segment slightly shorter than third, whitish, laterally and ventrally strongly irrorated dark greyish brown, third segment dark greyish brown with interrupted white lines dorsally and ventrally; scape shining dark brown with white apical ring, ventrally grey, antenna shining dark brown, paler ventrally, apical third yellowish-white. Thorax and tegulae shining dark brown with purplish gloss. Legs. Shining dark brown, tibia foreleg with white medial spot and white apical ring, tarsal segment one with white apical ring, segment five entirely white, tibia midleg with white medial and apical rings, tarsal segment one and two with white apical rings, segment five entirely white, hindleg as midleg, but tarsal segments one to four with white apical rings, spurs white. Forewing shining dark brown with purplish gloss and two fasciae, inner pale ochreous, near base and circular, outer beyond one-half, ochreous-white and inwardly bent in

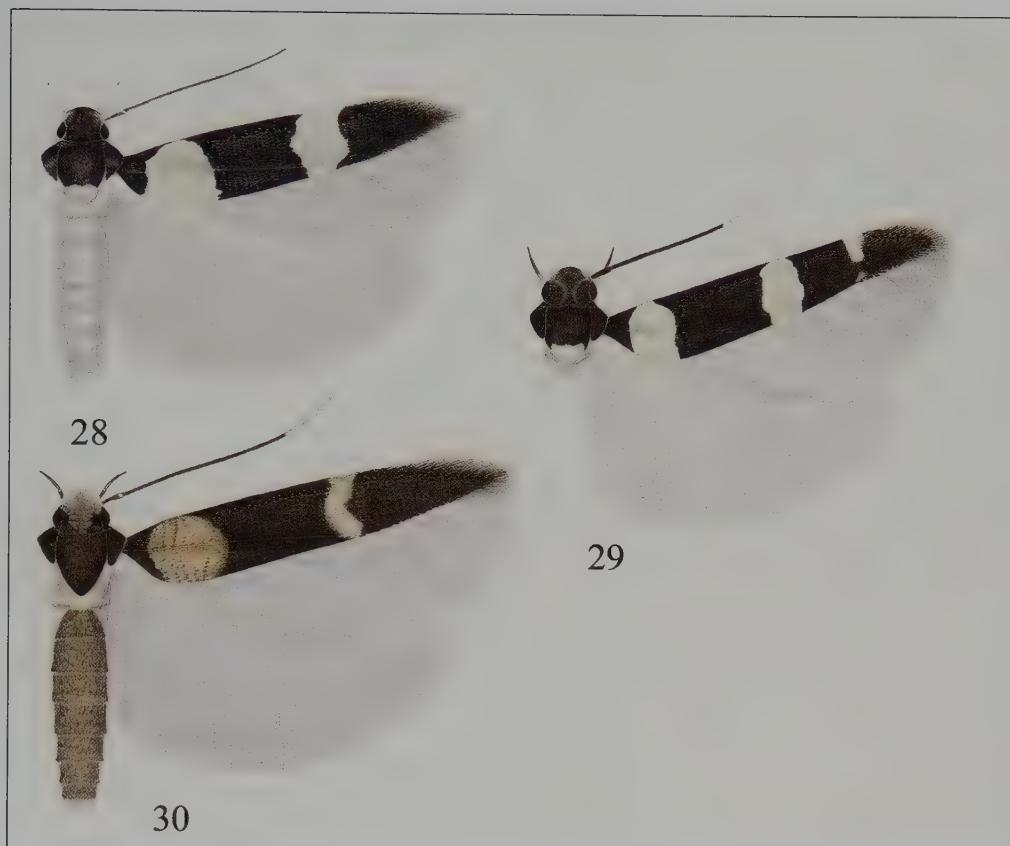


26



27

Figures 26–27. *Pseudascalenia riadella* Kasy. 23: Male genitalia, ventrally; 24: Female genitalia.



Figures 28–30. 28: *Bifascioides leucomelanellus* (Rebel); 29: *Gisilia sclerodes* (Meyrick); 30: *Gisilia gielisi* Koster nov. spec.

middle, both fasciae, especially inner, strongly irrorated greyish brown, cilia dark brown around apex, pale greyish-brown towards dorsum. Hindwing shining pale grey, cilia pale greyish-brown. Underside: forewing shining greyish brown, hindwing shining pale grey, at costa a grey streak. Abdomen dorsally and laterally greyish brown with bluish reflection, ventrally greyish brown, anal tuft white.

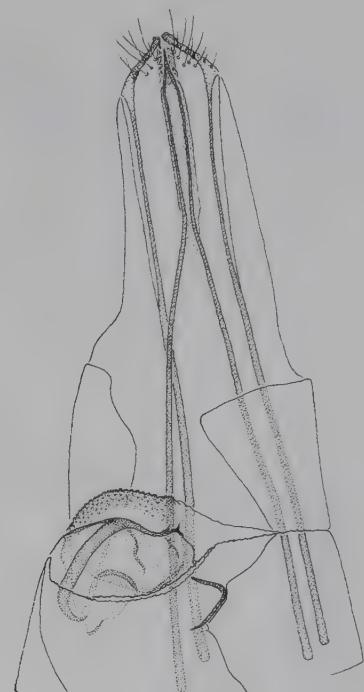
Male genitalia. Uncus absent. Tegumen very narrow, band-shaped. Valvae only slightly asymmetrical, cucullus of right valve broader than left one, gradually narrowing distally, cucullus of left valve spatulate, succuli as short humps, sacculus of right valve more rounded than left one, both cuculli and succuli covered with coarse setae. Aedeagus acutely bent at one-half, slightly narrowing apically, vesica with two short conical cornuti.

Remarks: Biology unknown. The VIII tergite has been fused with the tegumen for more than half of the anterior part, the remaining free part is narrowed and pointed and gives the impression of an uncus, below this 'uncus' is on each side on the free part of the VIII tergite a thorn-like extension. This peculiar shaped tergite VIII also occurs with the Oriental species '*Cholotis thoracista* Meyrick, 1915.

The specimen was collected in a garden in the middle of the town.

Distribution: Only known from the type-locality.

31



32



Figures 31–32. 31: *Gisilia sclerodes* (Meyrick), female genitalia; 32: *Gisilia gielisi* Koster nov. spec., male genitalia, ventrally.

Etymology: The name is dedicated to its collector, Dr. Cees Gielis from The Netherlands.

ACKNOWLEDGEMENTS

I would like to thank Dr. C. Gielis, Lexmond, The Netherlands, for the additional information of the vegetation of the collecting sites.

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Order Lepidoptera, family Choreutidae

Cees Gielis

INTRODUCTION

Choreutidae are moths which are characterized by the mottled grey brown colour, often mixed with shining metallic scales. Their size is small to medium in range. The family has approximately 400 described species, with representatives on all continents and climatic zones. In the palearctic region approximately 70 species are known (Diakonoff, 1986). Larvae mostly live on the upper surface of leaves of fruit trees of the families: Moraceae, Cupuliferae, and particularly Rosaceae. They make a loose web or net. Their economic importance is small; occasionally they are pests on fig trees.

MATERIALS AND METHODS

Specimens were collected in light traps, and on lamp-lit collecting sheets. Collecting was performed from mid-February till the end of April 2006 by C. Gielis, in April together with J. Buszko and M. Fibiger. The specimens are deposited in the UAE Invertebrate Collection and in the Nationaal Natuurhistorisch Museum (Naturalis), Leiden, Netherlands.

SYSTEMATIC ACCOUNT

Choreutis aegyptiaca (Zeller, 1867)

Specimens examined: Wadi Maidaq, 5 ex., 29.iii.2006 & 16.iv.2006, at light, leg. C. Gielis.

Diagnosis: Wingspan 11–13 mm. Head, thorax and abdomen grey-brown, mixed with pale grey scales. Legs grey-brown; tarsal segments grey-white, with ill-defined pale brown rings at base of segments two and three, and fifth segment dark black-brown.

Fore wings olive-brown, with three transverse bands of greyish scales: at base, just before middle and wide subterminal. At base of fringes a ferruginous-red row of fringe-scales.

Hind wings brown-orange to orange, with three longitudinal greyish dashes. This colour distinguishes it from related species. Fringes as in fore wing.

Ecology: The larvae make a webbing of tender leaves, also on the aerial roots on which a dense webbing is made. Recorded hostplants are *Ficus infectoria*, *F. glomerata*, and *F. bengalensis* (Fletcher, 1933).

Remarks. In the UAE, the hostplants probably will be *Ficus cordata* and/or *F. johannis*. Possibly *Ficus carica* planted in farms may serve as a hostplant as well.

Distribution: The species has been recorded from the Republic of South Africa, Uganda, Egypt, Israel, Saudi Arabia, Yemen, India and Nepal. New to the UAE.

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Plate 1. *Choreutis aegyptiaca* (Zeller).

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Order Lepidoptera, superfamily Pyraloidea (Part 2)

Jan Asselbergs

INTRODUCTION

The Pyraloidea of the United Arab Emirates were recently dealt with by Asselbergs (2008), bringing the number of species of Pyralidae known from the country up to 45 and that of Crambidae up to 41. Since then some more specimens became available for study and in the present contribution 5 species of Pyralidae and 2 species of Crambidae are added to the list. Two of the species of Pyralidae are new to science.

MATERIALS AND METHODS

The specimens dealt with are divided between the United Arab Emirates Invertebrate Collection, the private collection of J. Asselbergs, Bergen op Zoom, Netherlands, and the Nationaal Natuurhistorisch Museum, Leiden, Netherlands (RMNH), without mentioning this explicitly in the text. The holotypes are deposited in the RMNH. Most specimens have been collected at light by C. Gielis, who also made the photographs.

SYSTEMATIC ACCOUNT

Family Pyralidae

Subfamily Pyralinae Latreille, 1809

Acteniopsis robustus Asselbergs nov. spec.

Plate 1, Figures 1–2

Specimens examined. Holotype: ♂, GP 5787 Asb, United Arab Emirates, Wadi Maidaq, 460 m, 25°20'N 56°07'E, 12.iv.2006, at light, leg. C. Gielis, RMNH. Paratypes: 2♂, 10 km NE of Huwaylat, 18.iv.2006, at light, leg. J. Buszko.

Diagnosis: Average wingspan of the male 21 mm. Ground colour pale ochreous, sometimes suffused with reddish ochreous. Forewing with 2 darker slightly wavy transverse lines. Antemedian line paler edged at the inside, postmedian line paler edged at the outside. Hindwing mostly paler with 1 dark transverse line, most obvious on the underside of the wing.

Description of the male: Wingspan 22–24 mm, forewing 10–11 mm. Head chaetosemata present, ocelli present; proboscis vestigial; frons flat with adjacent scales. Labial palpi relatively short, 1.25 × eye, ochreous, straight and slightly drooping. Maxillary palpi ochreous, pencil-shaped, 1.5 × eye. Scape 1.5 × longer than broad. Flagellum with a double row of bipectinate ciliae 1.25 × width of shaft. Forewing slightly concave, ground colour pale ochreous, more or less heavily suffused with ochreous. Antemedian line from the costa at 2/5, then almost straight to dorsum at 2/5 with a paler edging at the inside of the line. Postmedian line from the costa at about 3/4, next with very faint waves to dorsum at 2/3 with paler edging at the outside. Costa of forewing narrowly edged with alternating dark and whitish scaling on the upper and underside of the wing. The discocellular spot(s) are absent. Fringe ochreous divided by a reddish ochreous line, scale tips dark and slightly shiny. Hind wing mostly paler than forewing and with a dark transverse line reaching costa only on underside of wing. Legs. Femur and distal part of tibia darker scaled than remainder of leg. The male genitalia. Uncus triangular, apex flat. Gnathos with hooked apex surpassing apex of uncus; lateral gnathos

branches with small extensions. Tegumen relatively slender, proximally with inwardly-directed extensions. Juxta ovoid, distally cleft. Valva slightly curved, sacculus and costal enforcement slightly sclerotized. Vinculum short, basally rounded. Phallus curved, $0.25 \times$ longer than costa of valva; vesica with 1 very slender cornutus less than $1/7 \times$ phallus and a small group of tiny spinulae.

Biology and first stages: Unknown.

Distribution: So far only known from the UAE.

Derivatio nominis: Named after the robustly built adult.

Subfamily **Phycitinae** Zeller, 1939

Cherchera abatesella Dumont, 1932

Plate 2, Figures 3–6

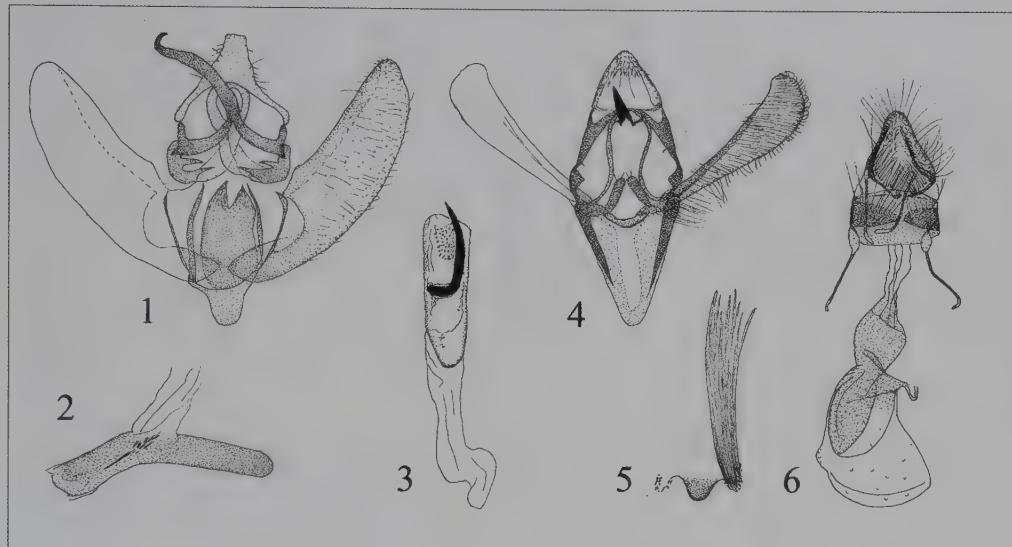
Specimens examined: 7 km N of Fujairah, 1♂, 15.iii.2006, 1♂, GP 5669 Asb, 1♀, GP 5721 Ass, same data. 5 km S of Huwaylat, 260 m, 2♂, 3♀, 21.iii.2006. Wadi Maidaq, 460 m, 5♂, 1♀, 14.iii.2006. Wadi al-Ejeili, 340 m, 4♂, 28.iii.2006. All at light, leg. C. Gielis. CANARY ISLANDS: Fuerteventura, Jandia, Bco Esquinzo, 1♂, leg. Paas, coll. A. Schmitz.

Diagnosis: Head. Frons with sclerified projection with blunt apex, face white in the lower part. A deep depression at the posterior base of the head has two aigrettes of fan-shaped scales, one at each side of the base of the antennae. Chaemosemata present, ocelli present, Proboscis normally developed. Labial palpi cream colour, $2.75 \times$ eye; 2nd segment with a proximal and a distal dark band; 3rd segment $0.5 \times$ eye, dark, bent forward. Maxillary palpi fan-shaped, about $0.5 \times$ 3rd segment of labial palpi. Shape of antennae $2 \times$ longer than broad. Male flagellum pubescent, on the segments 2–7 with short sclerified sensillae, female antennae filiform and nude. Wingspan 16–19 mm, forewing 7.0–8.5 mm. Basal field till the antemedian line heavily suffused with black scales; a blackish blotch in the middlefield between the costa and the cell and a black subapical patch bordering the postmedian line. A more or less obvious yellowish white stroke is running from the middle of the antemedian line towards the postmedian line. Antemedian line broad and white, postmedian line white and narrow, inwardly and outwardly finely bordered by a black and wavy line. Terminal line finely black. Fringe greyish mixed with brown divided by a row of dark brown dots. Hindwing white, iridescent, costa yellowish. Fringe white, basally divided by a brown band, marginally dark. Underside forewing greyish, apex and termen darker. Underside hindwing whitish yellow, apex blackish brown, termen brown, fringe white. Patagia, tegulae and thorax dark brown mixed with white scales. First tergite white. Abdomen pale earth-brown. Male tibiae at the inside with long pencils of hair-like scales. Male genitalia. Uncus an almost equilateral triangle, apex blunt. Gnathos tongue-shaped, about $3/5 \times$ uncus; lateral gnathos branches medially and laterally with extensions. Tegumen slender. Transtilla components about as long as gnathos, shaped as a curved T. Juxta with digitate processes about as long as gnathos, distally provided with a few hair-like setae. Valva broadest at cucullus; costal enforcement about $2/3 \times$ costa of valva. Sacculus medially sharply angled. Vinculum V-shaped, about $9/11 \times$ costa of valva. Phallus stout, cylindrical, about $0.9 \times$ costa of valva and with one curved big cornutus about $0.5 \times$ phallus. Culcita absent. Female genitalia. Ovipositor short, not extendable, apex rather blunt. Apophyses posteriores about as long as the apophyses anteriores, both are slender. Proximal margin of 8th segment straight. Ductus bursae with a gradual transition into the corpus bursae; proximal part of ductus bursae and distal part of egg-shaped bursa granulate. Ductus seminalis from distal part of bursa.

Biology and first stages: Larvae have been reported feeding on *Acacia tortilis* in Tunisia, (Dumont, 1932). In the UAE probably also feeding on *A. tortilis*, on *A. nilotica* or on *A.*



Plates 1–2. 1: *Acteniopsis robustus* Asselbergs nov. spec., male; 2: *Cherchera abatesella* Dumont, male.



Figures 1–6. 1–3: *Acteniopsis robustus* Asselbergs nov. spec., male genitalia; 4–6: *Cherchera abatesella* Dumont, 4–5: male genitalia; 6: female genitalia.

ehrenbergiana. The full-grown larva is 20–25 mm, subcylindrical, the last two segments narrower; they are greyish-brown with a reddish tinge with a white subdorsal and lateral line. According to Dumont (1932), the behaviour of the larvae is the same as in *Laodamia* (= *Oncocera*) *tahlaella* Dumont, 1932, i.e. larva at first at the extremities of the twigs between the young shoots, next constructing a tube following the bends of the twigs, becoming larger during the growth of the larva. Mostly the larvae are present in great numbers in a limited space. Finally, the remainder of the desiccated leaves, kept together by the threads spun by the moving larva can be observed.

Distribution: Tunisia (in 1928 found in Bled Tahla between Sfax and Gafsa); Canary Islands; Malta. New to the UAE.

Ancylosis (Syria) obscuripunctella Roesler, 1973

Plate 3, Figures 7–9

Specimens examined: Al-Ajban, 80 m., 1♂, GP 5750 Asb, 27.iii.2006, at light. leg. C. Gielis.

Diagnosis: Wingspan 9–15 mm. Frons flatly rounded. Labial palpi $11/3$ – $12/3$ × eye, 3rd segment $1/3$ × eye. Maxillary palpi very small. Proboscis normally developed. Scape 2× longer than broad. Male and female antennae filiform, ventrally pubescent. Ground colour forewing white to pale greyish, with or without more or less black sprinkling indicating the ante-median and postmedian line. Hindwing semihyaline, white. Male genitalia. Uncus egg-shaped, basally flat, terminally rounded. Gnathos largely 2/3 of uncus, apex slightly blunt. Transtilla components about as long as distal juxta prolongations. Valva broadest at cucullus and about, proximally with a small vault provided with a few hair-like setae. Transtilla components as long as the distal juxta prolongations. Juxta U-shaped. Vinculum almost U-shaped and slightly more than 1/2 of costa of valva with flatly rounded base. Phallus slightly more than costa of valva. Vesica distally with 2 rows of tiny cornuti. Culcita with bilaterally a scale bundle of about 8/9 × costa of valva.

Biology and first stages: Unknown.

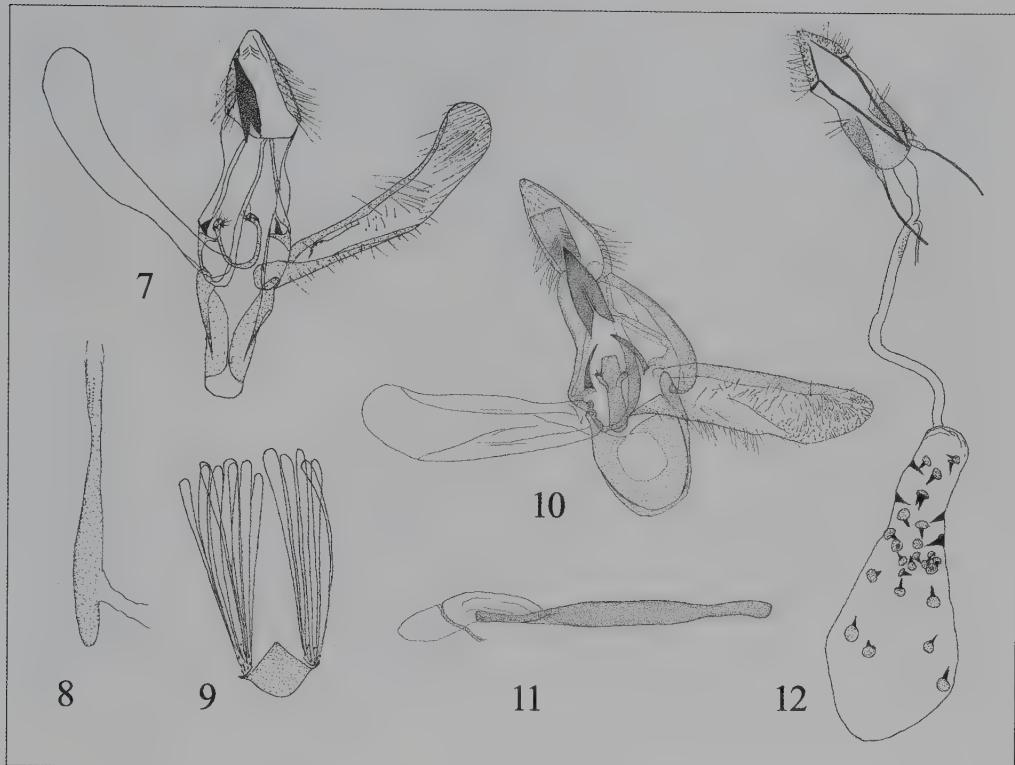


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4

Plates 3–4. 3: *Ancylosis (Syria) obscuripunctella* Roesler, male; 4: *Staudingeria (Staudingeria) albifrontella* Asselbergs nov. spec., male.



Figures 7–12. 7–9: *Ancylosis (Syria) obscuripunctella* Roesler, male genitalia; 10–11: *Staudingeria (Staudingeria) albifrontella* Asselbergs nov. spec., male genitalia; 12: *Staudingeria (Staudingeria) aspilatella* (Ragonot), female genitalia.

Distribution: Saudi-Arabia; Iran; Pakistan; Turkey. New to the UAE.

***Staudingeria (Staudingeria) albifrontella* Asselbergs nov. spec.**

Specimens examined. Holotype: ♂, GP 5788 Asb, United Arab Emirates, 7 km NE of Um al-Quwain, 0 m, 4.iii.2006, 25°31'N 55°36'E, at light, leg C. Gielis, RMNH.

Diagnosis: Wingspan 23.5 mm, forewing 11 mm. Forewing medium brown, sprinkled with white scales. Costa yellowish white from wingbase till 1/2. Hindwing semihyaline white, fringe white.

Description of the male: Forewing 11 mm. Ocelli present, chaemosemata present. Labial palpi cream colour, 1.5× eye, 3rd segment 1/3× eye. Maxillary palpi pencil-shaped, about 0.5× eye. Proboscis normally developed. Frons cream colour mixed with ochreous scales forming a scale-cone. Patagia and thorax ochreous, tegulae creamy white at the inner margin, the remaining parts ochreous. Scape 2× longer than broad, slightly swollen in the middle. Flagellum with tiny sclerified sensillae on the segments 2–6 and with a double row of ciliae which have 2.5× width of shaft. Forewing medium brown, sparsely sprinkled with white scales. Costa straight, basal half whitish. Apex relatively pointed. Hindwing semihyaline, white, fringe white. Tarsus of hindleg with numerous tiny black spines. Underside forewing whitish, underside hindwing white. Male genitalia. Uncus egg-shaped, apex rather pointed.

Plate 4, Figures 10–11



Plate 5. *Staudingeria (Staudingeria) aspilatella* (Ragonot), female.

Gnathos with low insertion, about $5/7 \times$ uncus, tongue-shaped and sharply pointed. Transtilla components slender, slightly curved and about $0.5 \times$ gnathos. Juxta stretched rectangular, about $4 \times$ longer than broad, basally slightly rounded with digitate processes originating bilaterally at $2/3$ from the base of corpus juxtae. Valva with nearly parallel costa and ventral margin. Costal enforcement not reaching cucullus. Vinculum short ovoid. Phallus cylindrical, about $1/3 \times$ longer than costa of valve, proximal and distal parts narrower.

Biology and first stages: Unknown.

Distribution: So far only known from the UAE.

Derivatio nominis: Named after the white scaled frons.

***Staudingeria (Staudingeria) aspilatella* (Ragonot, 1887)**

Specimens examined: Sharjah Desert Park, 80 m, 1♀, GP 5749 Asb, 10.iv.2006; 2♀, same data; 5 km SE of Mahafiz, 145 m, 1♀, 4.iv.2006. All at light, leg. C. Gielis.

Diagnosis: Wingspan 13–17 mm. Labial palps $12/3 \times$ eye, 3rd segment $1/4 \times$ eye. Flagellum filiform and pubescent in male and female. Ground colour forewing pale grey-yellowish. Costa mostly dirty whitish from base of wing till apex. A more or less brownish line along termen is characteristic. Fringe pale greyish-brown. Hindwing semi hyaline whitish, brownish at termen. Fringe white. Male genitalia see Roesler, 1973, Plate 80, Fig. 226. Uncus rather stretched, apex tapered. Gnathos tongue-shaped about half as long as uncus. Tegumen slender. Transtilla components stretched triangular about $1/2 \times$ gnathos length. Anellus U-shaped, terminal extremities slightly swollen and provided with a few hair-like setae. Valvae about $4 \times$ longer than broad. Vinculum heart-shaped, proximally rounded. Eight sternite with

Plate 5, Figure 12



6



7

Plates 6–7. 6: *Pediasia numidella* (Rebel), female; 7: *Epimetasia rufoarenalis* (Rothschild), male.

a curved slender transverse list and distally with a curved narrow lamella; the scale bush at both sides has $2/3 \times$ the length of the valve. The phallus is slender and curved and about 1/5 longer than the valve. Female genitalia (Fig. 12). Posterior apophyses about 1/3 longer than anterior apophyses. Ductus seminalis from terminal part of ductus bursae. Ductus bursae about 4/5 as long as corpus bursae. Bursa stretched pear-shaped. Proximal 1/4 and distal 1/6 part without thorns, rest of bursa with sclerified cone-shaped thorns on round sockets.

Biology and first stages: Unknown.

Distribution: Known from Algeria; Tunisia; Egypt; Iran; Bahrain; Iran; Afghanistan; Turkmenistan and the Ural Mountains. New to the UAE.

Family Crambidae

Subfamily Crambinae Latreille, 1810

Pediasia numidella (Rebel, 1903)

Plate 6, Figures 13–15

Material examined: Al-Ajban, 80 m, 1♂, GP 5840 Asb, 2.iv.2006; 1♀, GP 5786 Asb, 27.iii.2006; 4♀, same data. All at light, C. Gielis.

Diagnosis: Wingspan 21.5–31 mm, forewing 10.0–14.5 mm. Thorax and tegulae greyish brown. Fore-wing greyish brown, costa sometimes slightly darker. In dark specimens the veins are mostly paler and contrasting with the ground colour. Forewing without pattern except for 2–3 terminal dots. Fringe as the ground colour and slightly shiny. Hindwing white, fringe white.

Biology and first stages: Unknown.

Distribution: Algeria; Saudi Arabia; Kuwait; Bahrain; Iran; Egypt. New to the UAE.

Subfamily Odontiinae Guenée, 1854

Epimetasia rufoarenalis (Rothschild, 1913)

Plate 7, Figures 16–18

Specimens examined: Wadi Maidaq, 460 m, 1♂, GP 5844 Asb, 2.iii.2006; 1♀, GP 5686 Asb, 14.iii.2006; both at light, leg. C. Gielis.

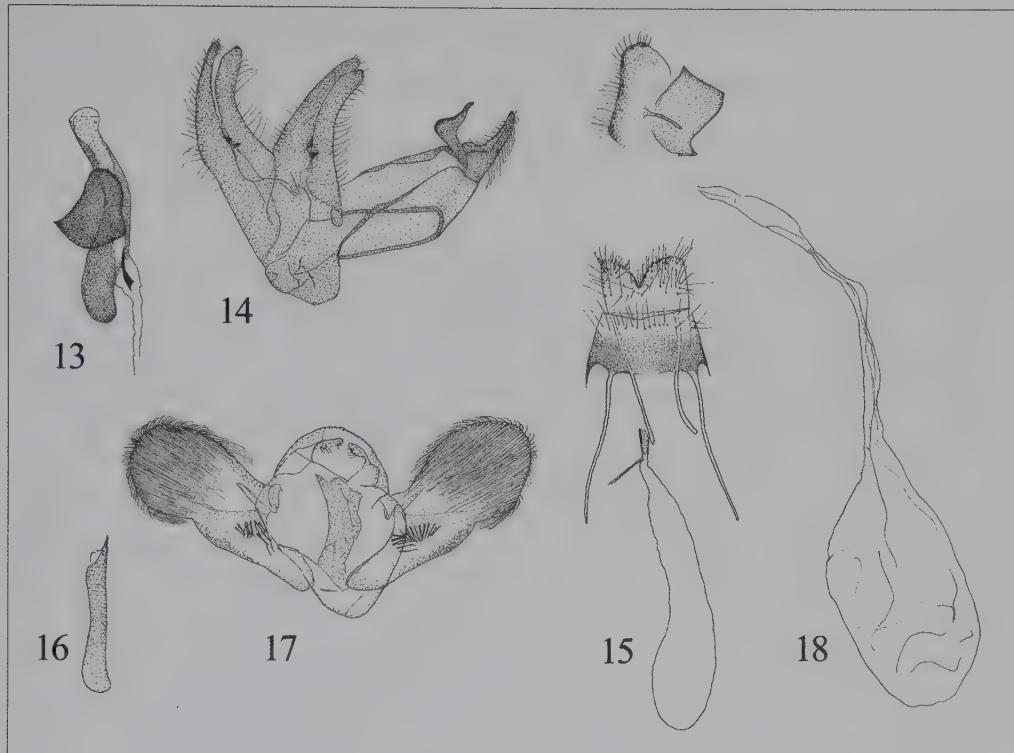
Diagnosis: Wingspan 23 mm, forewing 11 mm. Head. Frons almost flat, but with slightly protruding frontal scales in the lower part. Labial palpi ochreous, underside white, porrect, $1.5 \times$ eye. Maxillary palpi ochreous, slightly less than $0.5 \times$ eye. Male flagellum ventrally setose, setae on basal 3/4 of flagellomeres as long as their diameter. Female flagellum pubescent. Forewing with straight costa, ochreous. Wing surface sparsely scattered with white scales. Antemedian and postmedian line separate at dorsum. Postmedian line vertical at dorsum. Fringe cream-coloured divided by 2 ochreous lines. Hindwing slightly paler than forewing, fringe cream coloured divided by 2 ochreous lines. Underside forewing pale ochreous, dorsum creamy white. Underside hindwing uniform pale ochreous.

Male genitalia. Uncus bilobed. Tegumen convex. Juxta rectangular. Valvae medioventrally convex, cucullus evenly curved, setose. Sacculus with a group of stiff setae. Vinculum basally rounded. Phallus cylindrical, about as long as costa of valva, apex unilateral sharply pointed.

Female genitalia. Papillae anales lobiform, setose. 8th Segment with straight proximal edge. Apophyses posteriores slightly shorter than apophyses anteriores. Ductus seminalis from proximal edge of colliculum.

Biology and first stages: Larvae of the closely related *E. monotona* (Amsel, 1953) were found in Morocco in the roots of *Trichodesma calcarata* (Boraginaceae). In the UAE, Wadi Maidaq, *T. enetotrichum* is a possible foodplant of *E. monotona*.

Distribution: Algeria; Central Western Sahara. New to the UAE.



Figures 13–18. 13–15: *Pediasia numidella* (Rebel), 13–14: Male genitalia; 15: Female genitalia; 16–18: *Epimetasia rufoarenalis* (Rothschild), 16–17: Male genitalia; 18: Female genitalia.

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The author thanks Cees Gielis for collecting the rich material in the UAE and also for photographing the specimens and scanning the genital drawings.

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Order Diptera, family Chironomidae (with the exception of the tribe Tanytarsini)

Trond Andersen and Humberto F. Mendes

INTRODUCTION

Members of the family Chironomidae or non-biting midges are true flies, belonging to the suborder Nematocera of the order Diptera. The adults have a single pair of wings, the hind pair being modified as halteres. The adult males are slender-bodied and vary considerably in size with wing length ranging from about 0.6 to more than 7 mm. The males of most species have plumose antennae and resemble biting midges (Ceratopogonidae). However, the two families can easily be separated on the wing venation as chironomids have a simple M_{1+2} vein, while this vein has a distal fork in ceratopogonids.

The chironomids are the most widely distributed and often the most abundant insects in fresh water. Chironomid larvae occur in almost every freshwater habitat and some are remarkably tolerant of high levels of pollution. The family also includes many terrestrial or semi-terrestrial species and others that thrive in brackish water or intertidal pools. It has been estimated that there are as many as 15,000 species worldwide, many of which are still undescribed.

Eleven subfamilies of Chironomidae are recognized of which 6 are distributed worldwide. Three of these subfamilies are recorded from the Arabian Peninsula (Cranston, 1989; Cranston & Judd, 1989): Tanypodinae with 10 species, Orthocladiinae with 5 species, and Chironominae with 38 species. However, *Chironomus calipterus* Kieffer and *Polypedilum (T.) bifurcatum* Cranston are the only two species recorded from the United Arab Emirates by Cranston & Judd (1989). As part of the present survey the Tanytarsini (Chironominae) was treated by Gilka (2009), recording four genera with altogether 7 species, two of which were new to science. Below the remaining chironomid species from the United Arab Emirates are documented, listing 4 species of Tanypodinae, 4 species of Orthocladiinae of which 2 are new to science and 14 species of Chironominae of which 2 are new to science. In total 29 species belonging to 19 genera in three subfamilies are now recorded from the United Arab Emirates.

MATERIALS AND METHODS

All specimens were collected by A. van Harten with light traps (LT), Malaise traps (MT), and yellow and white water traps (WT). For exact data on the sampling sites see van Harten (2008). NARC = National Avian Research Centre. The material was preserved in alcohol; all specimens examined were later dissected, cleared, and slide mounted in Canada balsam following the procedure outlined by Pinder (1989).

The morphological terminology follows Sæther (1980); most morphological abbreviations are listed and figured in Gilka (2009). Measurements are given as the range, followed by the mean, followed by the number of specimens measured in parenthesis if fewer than initially stated. The short diagnosis of previously described species is based on five randomly selected specimens; the descriptions of new species are based on 10 specimens, when available. The coloration is based on cleared, slide mounted specimens.

Designated holotypes, some paratypes and selected specimens of all species recorded are housed in the Department of Natural History, Bergen Museum, University of Bergen, Bergen,

Norway (ZMBN); the remaining material is deposited in the United Arab Emirates Invertebrate Collection.

SYSTEMATIC ACCOUNT

Key to subfamilies (imagines)

- 1** Wing with crossvein MCu present (Fig. 1) **Tanypodinae**
- Wing with crossvein MCu absent (Fig. 21) **2**
- 2** Fore tarsomere 1 shorter than foretibia. Gonostylus movable and usually folded inwards (Fig. 22). Hind tibial comb composed of free spiniform setae **Orthocladiinae**
- Fore tarsomere 1 longer than foretibia. Gonostylus rigidly fused to gonocoxite (Fig. 40) **Chironominae**

Subfamily **Tanypodinae** Thienemann & Zavřel, 1916

Key to males

- 1** MCu proximal to FCu (tribe Procladiini) (Fig. 1) **2**
- MCu ending at FCu (tribe Pentaneurini) (Fig. 9) **3**
- 2** Gonostylus sharply hooked, without posterior heel (Fig. 4) *Djalmabatista reidi* (Freeman)
- Gonostylus with posterior heel (Fig. 8) *Procladius (Halocladius) apicalis* (Kieffer)
- 3** Tibiae with conspicuous dark rings. Gonostylus elongate with characteristic cochleariform megaseta (Fig. 14) *Ablabesmyia longistyla* Fittkau
- Tibiae without dark rings. Gonostylus elongate with spine-like megaseta (Fig. 18) *Paramerina vaillanti* Fittkau

Tribe **Procladiini** Roback & Moss, 1978

Genus **Djalmabatista** Fittkau, 1968

The genus is most species rich in the Neotropical region, and has also been taken in the Nearctic, Afrotropical, and Australian regions and in Palaearctic China. In the Neotropical region the larvae live predominantly in rivers, but have also been found in ponds and lakes.

Djalmabatista reidi (Freeman, 1955)

Figures 1–4

Specimens examined: Al-Ajban, 1♂, 17.x–9.xi.2005, MT.

Diagnosis, male (n = 1): Total length 3.71 mm. Wing length 1.49 mm. Total length / wing length 2.49. Colouration: Thorax pale, preepisternum, postnotum, and ventral part of scutellum dark brown. Wing translucent with darker area at RM. Legs amber, all tarsomeres of fore- and midleg lost, hind leg with tarsomeres 3–5 dark brown. Abdomen pale with median, well defined dark marks on tergites II–VII, tergite VIII with dark oral margin, gonostylus dark brown. Wing (Fig. 1): VR 1.40. Hypopygium (Figs 2–4): Phallapodeme 127 µm long. Gonocoxite 182 µm long. Gonostylus 100 µm long; megaseta 10 µm long. HR 1.82; HV 3.72.

Remarks: The species was placed in the genus *Djalmabatista* by Sæther & Andersen (2000).

Distribution: The species was described from Sudan as *Procladius (Psilotanypus) reidi* by Freeman (1955: 61). It is recorded from the Afrotropical Region, from Saudi Arabia and the

UAE on the Arabian Peninsula, and from India (Chaudhuri et al., 2001; Cranston & Judd, 1989).

Genus *Procladius* Skuse, 1889

The genus is species rich and has a world wide distribution. Three subgenera are recognized. The larvae live in the sediment in lakes, ponds, and slow flowing rivers. Many species are tolerant of mildly polluted conditions.

Procladius (Halocladius) apicalis (Kieffer, 1918)

Figures 5–8

Specimens examined: Al-Ajban, 2♂, 21–28.xii.2005, MT & LT. SSW of ad-Dhaid, 2♂, 10–15.xii.2005, LT. Fujairah, 3♂, 2.v–5.vi.2005, LT. Sharjah Desert Park, 1♂, 18–25.i.2005, LT; 3♂, 25.i–22.ii.2005, LT; 4♂, 22.ii–9.iii.2005, LT; 6♂, 9–21.iii.2005, LT; 9♂, 30.iv–7.v.2005, LT; 5♂, 30.iv–31.v.2005, LT; 10♂, 31.v–30.vi.2005, LT; 2♂, 30.vi–21.vii.2005, LT; 2♂, 21.vii–5.viii.2005, LT; 2♂, 20.x–8.xi.2005, LT. Wadi Maidaq, 9♂, 27.xi–22.xii.2005, LT; 3♂, 12–14.iv.2005, MT & WT.

Diagnosis, male (n = 5): Total length 2.47–3.21, 2.90 mm. Wing length 1.23–1.70, 1.49 mm. Total length / wing length 1.88–2.05, 1.94. Wing length / length of profemur 2.20–2.37, 2.29. Colouration: Thorax dark brown. Wing translucent with dark area at RM. Legs light brown becoming gradually darker towards tarsomere 5. Abdomen pale, tergites II–V/VI and VIII with dark oral bands, tergites VI–VII/VIII uniformly dark brown, hypopygium dark brown. Head: AR 1.33–1.53, 1.46. Wing (Fig. 5): VR 1.46–1.55, 1.50. Foreleg: LR₁ 0.60–0.66, 0.64; profemur 543–718, 652 µm long. Hypopygium (Figs 6–8): Phallapodeme 84–129, 102 µm long. Gonocoxite 166–182, 173 µm long. Gonostylus 63–82, 71 µm long; megaseta 8–11, 10 µm long. HR 2.20–2.82, 2.47; HV 3.50–4.93, 4.13.

Distribution: The species was described from South Africa as *Tricotanypus apicalis* by Kieffer (1918b: 62). It is distributed in the Afrotropical region and was recorded from Saudi Arabia by Cranston & Judd (1989).

Tribe Pentaneurini Fittkau, 1962

Genus *Ablabesmyia* Johannsen, 1905

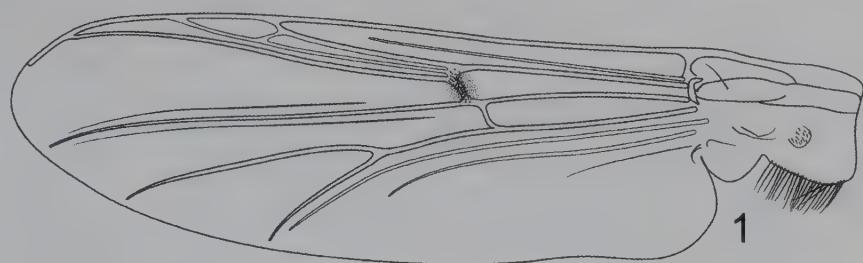
The genus is species rich and has a world wide distribution. Four subgenera are recognized. The larvae live in a wide variety of lotic and lentic habitats including bog pools, ponds, the littoral zone of lakes, and in rivers and streams.

Ablabesmyia (Ablabesmyia) longistyla Fittkau, 1962

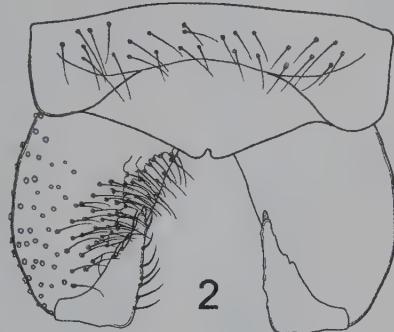
Figures 9–14

Specimens examined: Al-Ajban, 1♂, 17.x–9.xi.2005, MT; 1♂, 21–28.xii.2005, MT & LT. Fujairah, 2♂, 6.iv–2.v.2005, LT. Sharjah Desert Park, 1♂, 10.xi.2004, LT; 8♂, 18–25.i.2005, LT; 20♂, 25.i–22.ii.2005, LT; 8♂, 22.ii–9.iii.2005, LT; 8♂, 9–21.iii.2005, LT; 5♂, 30.iv–7.v.2005, LT; 4♂, 30.iv–31.v.2005, LT; 5♂, 31.v–30.vi.2005, LT; 2♂, 21.vii–5.viii.2005, LT; 2♂, 20.x–8.xi.2005, LT.

Diagnosis, male (n = 5): Total length 2.81–3.37, 3.04 mm. Wing length 1.34–1.76, 1.54 mm. Total length / wing length 1.88–2.10, 1.99. Wing length / length of profemur 2.16–2.45, 2.29. Colouration: Thorax dark brown. Wing translucent with dark spots. Legs amber, femora brown with dark ring preapically, tibiae brown with three dark rings, tarsomere 1 pale with two dark rings, tarsomeres 2–3 pale with dark ring near apex, tarsomeres 4–5 pale becoming gradually darker towards apex. Abdomen pale, tergites II–V and VIII with dark oral bands, tergites VI–VII uniformly dark brown, gonocoxite darker orally. Head: AR 1.59–1.89, 1.69. Wing (Fig. 9): VR 0.76–0.90, 0.83. Foreleg: LR₁ 0.70–0.77, 0.74; profemur 617–718, 670



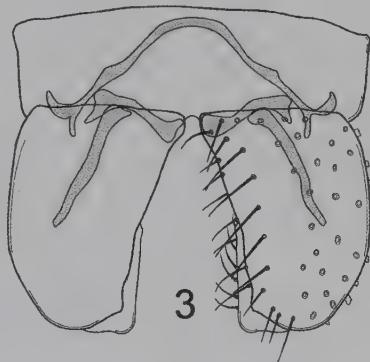
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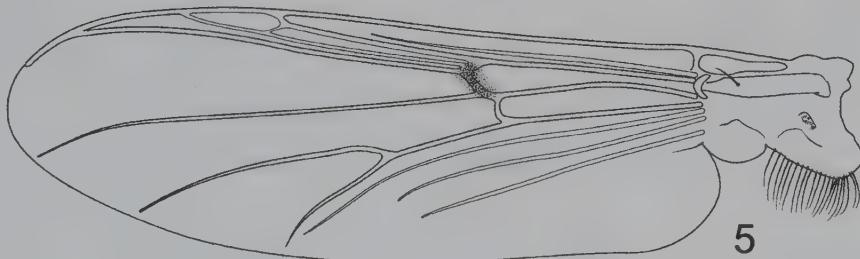
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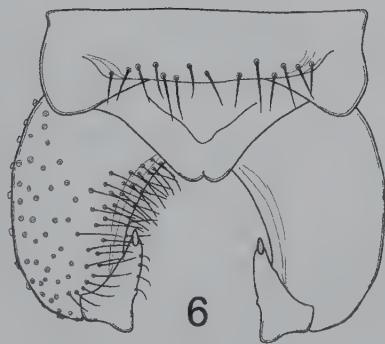
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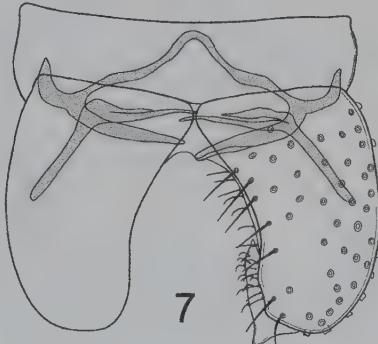
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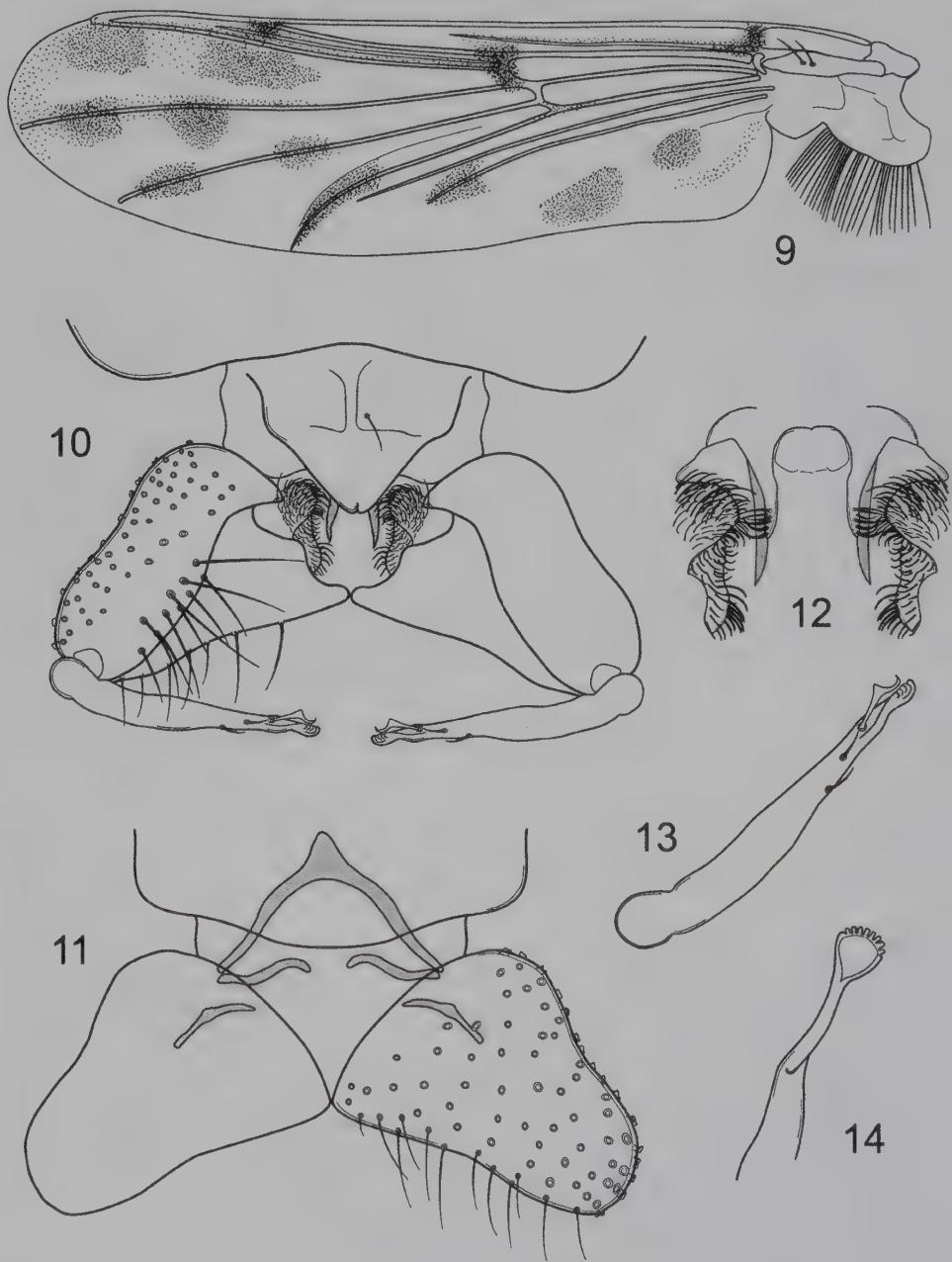


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Figures 1–8. *Djalmabatista reidi* (Freeman) (1–4) and *Procladius (Halocladius) apicalis* (Kieffer) (5–8). 1 & 5: Wing; 2 & 6: Hypopygium, dorsal view; 3 & 7: Hypopygium, ventral view; 4 & 8: Gonostylus.



Figures 9–14. *Ablabesmyia (A.) longistyla* Fittkau. 9: Wing; 10: Hypopygium, dorsal view; 11: Hypopygium, ventral view; 12: Median, inferior and superior volsella; 13: Gonostylus; 14: Megaseta.

µm long. Hypopygium (Fig. 10–14): Phallapodeme 49–57, 54 µm long. Gonocoxite 136–159, 146 µm long. Gonostylus 132–154, 144 µm long; megaseta 23–27, 24 µm long. HR 0.98–1.04, 1.01; HV 1.97–2.29, 2.11.

Remarks: According to Cranston & Judd (1989) Saudi Arabian specimens appear to lack a distinct dark mark at the apex of wing vein R_{2+3} . The specimens from UAE have this distinct dark mark, thus being similar to specimens from Western Europe.

Distribution: The species is widespread in the Palaearctic region including North Africa (Sæther & Spies, 2004). In the Near East it is recorded from Turkey, Lebanon, Syria, Egypt, Saudi Arabia and Oman (Cranston & Judd, 1989).

Genus *Paramerina* Fittkau, 1962

The genus has a world wide distribution. The larvae are found in ponds and pools and slow flowing rivers and streams.

Paramerina vaillanti Fittkau, 1962

Figures 15–18

Specimens examined: Al-Ajban, 1♂, 22.ii–9.iii.2005, MT & LT; 12♂, 21–28.xii.2005, MT & LT; 1♂, 20.x–8.xi.2005, LT; 4♂, 7.x–9.xi.2005, MT; 3♂, 9–16.xi.2005, MT. Sharjah Desert Park, 4♂, 18–25.i.2005, LT; 3♂, 25.i–22.ii.2005, LT; 2♂, 9–21.iii.2005, LT; 2♂, 30.iv–7.v.2005, LT; 1♂, 31.v–30.vi.2005, LT; 1♂, 21.vii–5.viii.2005, LT; 2♂, 20.x–8.xi.2005, LT. Wadi Maidaq, 2♂, 27.xi–22.xii.2005, LT.

Diagnosis, male (n = 5): Total length 2.24–2.73, 2.52 mm. Wing length 1.22–1.53, 1.40 mm. Total length / wing length 1.71–1.91, 1.80. Wing length / length of profemur 1.93–2.45, 2.26. Colouration: Thorax pale, preepisternum, postnotum, and scutellum dark brown. Wing translucent. Legs uniformly amber, foreleg slightly darker. Abdomen pale, tergites II–V with dark oral bands, tergites VI–VIII uniformly dark brown, hypopygium pale. Head: AR 1.42–1.66, 1.52. Wing (Fig. 15): VR 0.82–0.95, 0.87. Foreleg: LR₁ 0.58–0.65, 0.60; profemur 589–663, 600 µm long. Hypopygium (Figs 16–18): Phallapodeme 109–123, 117 µm long. Gonocoxite 154–195, 178 µm long. Gonostylus 132–150, 141 µm long; megaseta 15–20, 18 µm long. HR 1.15–1.39, 1.26; HV 1.67–1.88, 1.78.

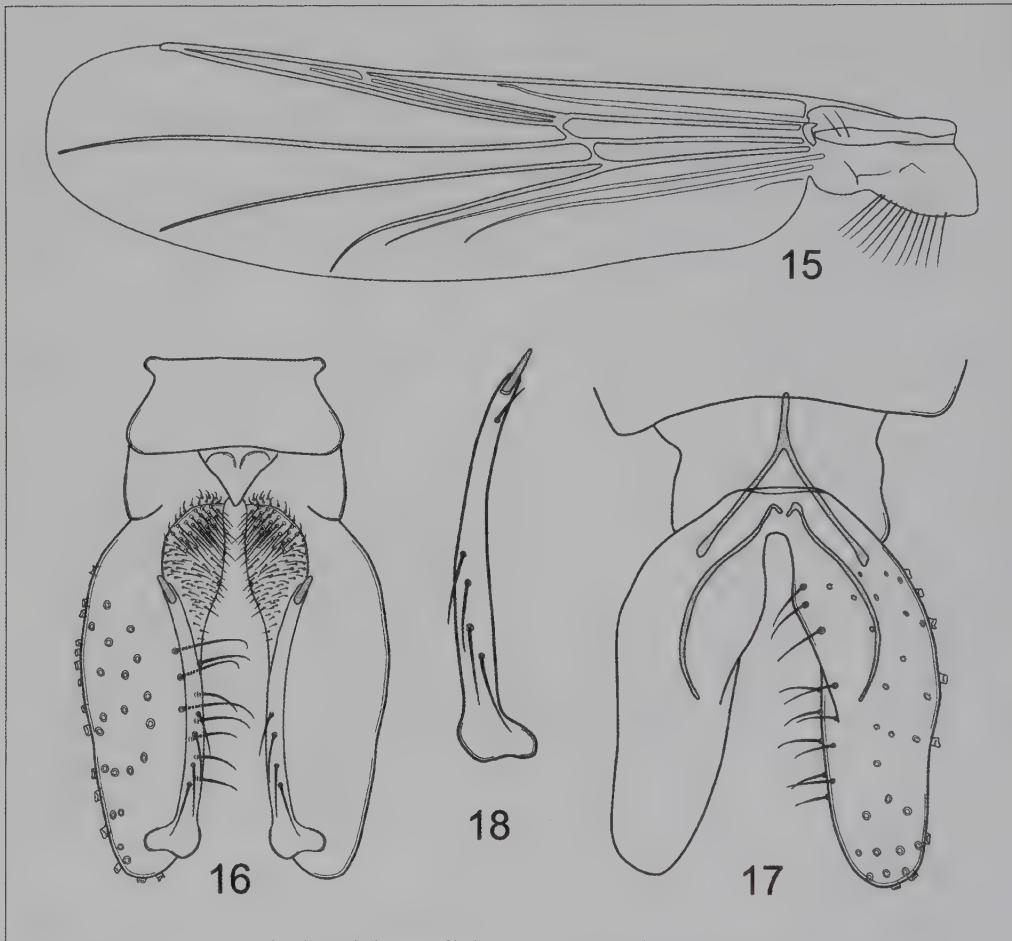
Remarks: According to Cranston & Judd (1989) and Sæther (2004) *P. vaillanti* is very similar to *P. minima* (Kieffer, 1911) known only from the Mahé Island in the Seychelles and could conceivably prove to be a junior synonym.

Distribution: This species was described from Algeria by Fittkau (1962: 335). It is distributed in the Canary Islands, North Africa, and in the Near East (Sæther & Spies, 2004). In the Arabian Peninsula it is previously recorded from Saudi Arabia (Cranston & Judd, 1989).

Subfamily *Orthocladiinae* Edwards, 1929

Key to males

- 1 With distinct anal point protruding from posterior margin of tergite IX 2
- Anal point dorsally on tergite IX, not protruding from posterior margin of tergite IX (Fig. 34) *Pseudosmittia danconai* Marcuzzi
- 2 With virga consisting of strong spines 3
- Without virga (Fig. 32) *Psectrocladius limbatellus* (Holmgren)
- 3 Anal point long, nearly parallel-sided in apical half (Fig. 22) *Bryophaenocladius clavatus* Andersen & Mendes nov. spec.
- Anal point short, broadly triangular (Fig. 28) *Bryophaenocladius rostratus* Andersen & Mendes nov. spec.



Figures 15–18. *Paramerina vaillanti* Fittkau. 15: Wing; 16: Hypopygium, dorsal view; 17: Hypopygium, ventral view; 18: Gonostylus.

Genus *Bryophaenocladius* Thienemann, 1934

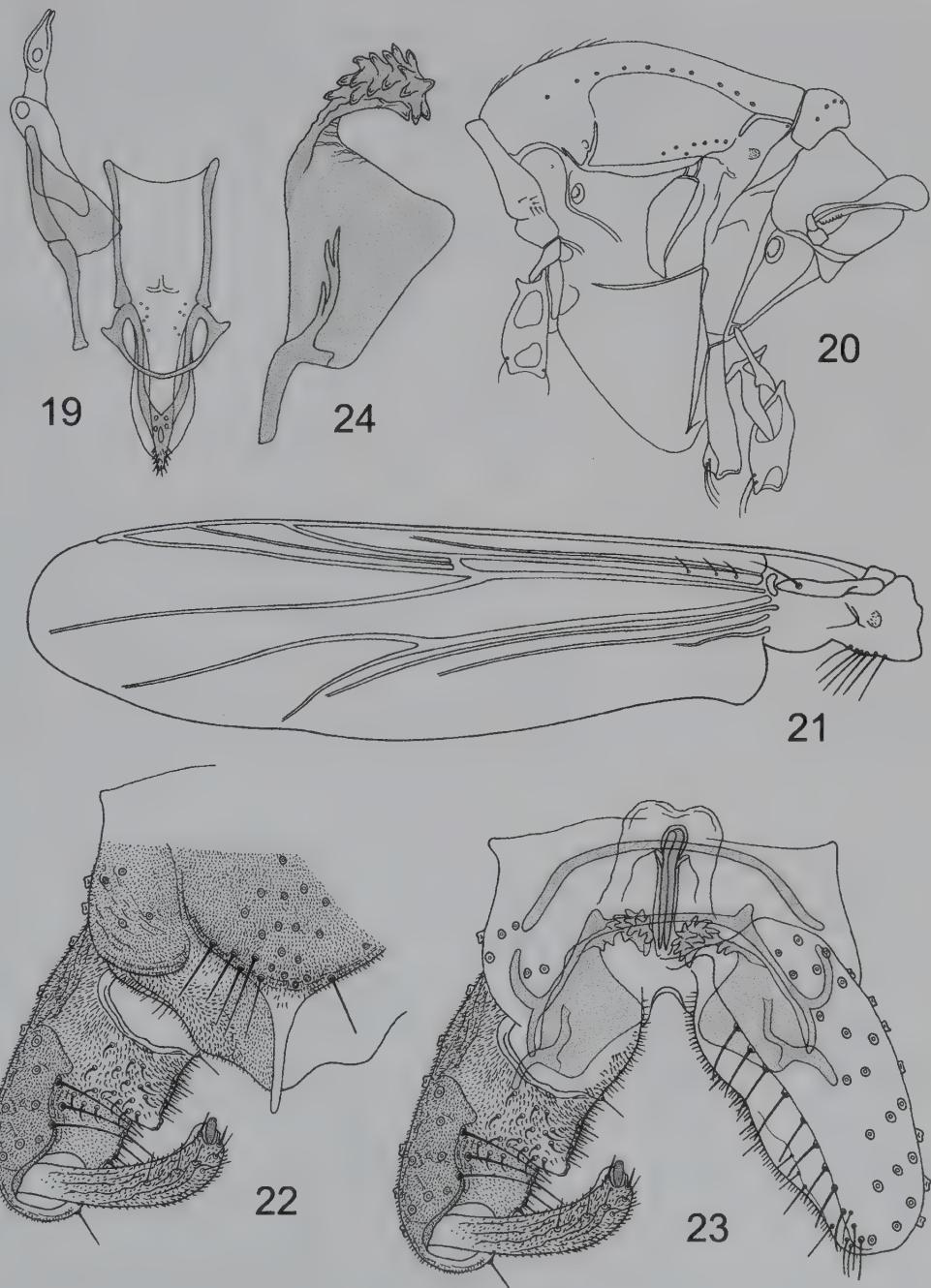
The genus is species rich and has a world wide distribution. Most species are terrestrial or semiterrestrial.

Bryophaenocladius clavatus Andersen & Mendes nov. spec.

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Maidaq [25°19'N, 56°08'E], 410 m a.s.l., 28.xi–1.xii.2005, WT, A. van Harten leg. (ZMBN). Paratypes: 20♂, as holotype; 4♂, as holotype but 5.iii.2005, hand collecting & WT.

Diagnostic characters: The species groups with species lacking digitiform extension of palpomere 3, having fully developed hind tibial comb, coarse punctuation on wing membrane, setose squama, and only one megaseta. The characteristic anal point combined with the large club-shaped spinuous oral projection of the phalapodeme will separate the species from other members of the genus.

Figures 19–24, Table 1



Figures 19–24. *Bryophaenocladius clavatus* Andersen & Mendes nov. spec. 19: Tentorium, stipes, and cibarial pump; 20: Thorax; 21: Wing; 22: Hypopygium, dorsal view; 23: Hypopygium with tergite IX and anal point removed, dorsal view left, ventral view right; 24: phallapodeme.

Description, male (n = 10): Total length 2.12–2.51, 2.28 mm. Wing length 1.08–1.30, 1.21 mm. Total length / wing length 1.75–2.01, 1.89. Wing length / length of profemur 1.92–2.31, 2.16. Colouration: Thorax dark brown. Wing translucent with darker area at brachiolum, veins darker than membrane. Legs brown. Abdomen dark brown. Head: AR 1.65–2.01, 1.86. Ultimate flagellomere 439–504, 470 µm long. Temporal setae 7–12, 10 including 4–7, 5 inner verticals, uniserial to irregularly biserial; 2–5, 3 outer verticals, uniserial; and 1–3, 2 postorbitalis, uniserial. Clypeus with 8–15, 11 setae. Tentorium, stipes, and cibarial pump as in Figure 19. Tentorium 107–129, 123 µm long; 21–27, 24 µm wide. Stipes 132–152, 140 µm long; 36–54, 47 µm wide. Palp segment lengths (in µm): 25–32, 28; 43–57, 50; 88–109, 100; 82–111, 97; 116–150, 134. Third palpomere with 5–7, 6 sensilla; longest 16–23, 20 µm long. Thorax (Fig. 20): Antepronotum with 4–6, 5 setae. Dorsocentrals 7–21, 12, uniserial to irregularly biserial; acrostichals 9–15, 12, all decumbent and starting close to antepronotum; prealars 5–9, 6 uniserial to irregularly biserial; supraalar 1–2, 1. Scutellum with 8–12, 9 setae. Wing (Fig. 21): VR 1.18–1.33, 1.23. C extension 38–50, 43 µm long. Cu₁ straight to slightly sinuous. Wing membrane with coarse punctuation. Brachiolum with 1 seta; R with 3–5, 4 setae; remaining veins bare. Squama with 4–7, 6 setae. Anal lobe protruding. Legs: Spur of foretibia 40–48, 44 µm long; spurs of midtibia 23–32, 11 µm and 20–27, 22 µm long; spurs of hind tibia 45–63, 51 µm and 17–27, 19 µm long. Width at apex of foretibia 23–34, 30 µm; of midtibia 28–34, 31 µm; of hind tibia 34–42, 38 µm. Comb with 10–14, 12 setae; longest 27–41, 35 µm; shortest 20–27, 23 µm long. Lengths and proportions of legs as in Table 1. Hypopygium (Figs 22–23): Tergite IX with 11–24, 16 setae; laterosternite IX with 3–6, 4 setae. Anal point narrowly triangular; 41–58, 51 µm long; 16–27, 21 µm wide at base; 3–6, 5 µm wide at apex. Phallapodeme (Fig. 24) 93–103, 98 µm long, including club-shaped oral projection; transverse sternapodeme nearly straight, 73–86, 80 µm long. Virga 46–68, 58 µm long. Gonocoxite 160–175, 167 µm long. Gonostylus 91–98, 93 µm long with low, rounded crista dorsalis in apical third; megaseta 6–9, 8 µm long. HR 1.71–1.88, 1.79; HV 2.33–2.69, 2.43.

Table 1. Lengths (in µm) and proportions of legs of *Bryophaenocladius clavatus* Andersen & Mendes nov. spec., male (n: p₁ = 3–9; p₂ & p₃ = 6).

	fe	ti	ta₁	ta₂	ta₃	ta₄
p₁	511–601, 554	540–662, 609	374–403	198–223	137–151	83–101
p₂	526–626, 583	536–630, 586	266–317, 287	119–150, 134	94–112, 103	54–73, 65
p₃	569–666, 623	630–756, 684	371–425, 396	191–213, 198	133–162, 148	72–86, 81
	ta₅		LR	BV	SV	BR
p₁	61–72		0.63–0.66	2.96–3.04	2.88–3.08	2.5–3.3
p₂	47–61, 53		0.47–0.51, 0.49	3.85–4.30, 4.07	3.90–4.23, 4.04	2.7–4.1, 3.1
p₃	61–72, 65		0.56–0.61, 0.59	3.35–3.49, 3.42	3.15–3.40, 3.25	3.6–5.1, 4.3

Remarks: In hypopygial features the species shows some resemblance with *B. paraproductus* Cranston & Judd, 1989, described from Saudi Arabia. However, the two species can easily be separated on the shape of the oral projection of the phallapodeme, and the presence of postorbitalis and sensilla on palpomere 3 in *B. clavatus* nov. spec.

Distribution: This species is only known from the type locality.

Etymology: From Latin *clavus*, club, referring to the club-shaped oral projection of the phallapodeme.

***Bryophaenocladius rostratus* Andersen & Mendes nov. spec.**

Figures 25–29

Type material: Holotype: ♂, United Arab Emirates, Wadi Maidaq [25°19'N, 56°08'E], 410 m a.s.l., 28.xi–1.xii.2005, WT, A. van Harten leg. (ZMBN).

Diagnostic characters: The species groups with species lacking digitiform extension of palpomere 3, having fully developed hind tibial comb, coarse punctuation on wing membrane, setose squama, and only one megaseta. The short, triangular anal point and characteristic subrectangular inferior volsella combined with the very large virga and the beak-like oral projection of the phallapodeme will separate the species from other members of the genus.

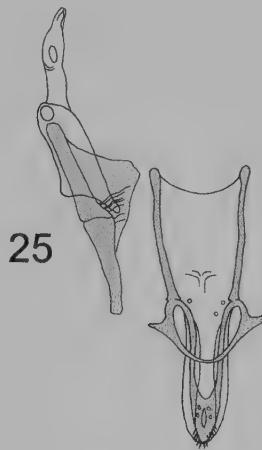
Description, male (n = 1): Total length 2.23 mm. Wing length 1.34 mm. Total length / wing length 1.66. Wing length / length of profemur 2.61. Colouration: Thorax dark brown. Wing translucent with darker area at brachiolum, veins darker than membrane. Legs brown, tarsi lost. Abdomen dark brown. Head: AR 1.80. Ultimate flagellomere 500 µm long. Temporal setae 10 including 5 inner verticals, 3 outer verticals, and 2 postorbitalis. Clypeus with 12 setae. Tentorium, stipes and cibarial pump as in Figure 25. Tentorium 120 µm long, 19 µm wide. Stipes 129 µm long, 43 µm wide. Palp segment lengths (in µm): 27, 50, 95, 91, 150. Third palpomere with 8 sensilla, longest 16 µm long. Thorax (Fig. 26): Antepronotum with 4 setae. Dorsocentrals 13; acrostichals at least 11, all decumbent starting close to antepronotum; prealars 7; supraalar 1. Scutellum with 10 setae. Wing (Fig. 27): VR 1.25. C extension 48 µm long. Wing membrane with coarse punctuation. Brachiolum with 1 seta, R with 4 setae, remaining veins bare. Squama with 4 setae. Anal lobe protruding. Legs: Forefemur 526 µm long, midfemur 562 µm long, hind femur 590 µm long; foretibia 529 µm long, midtibia 506 µm long, hind tibia 655 µm long; all tarsi broken. Spur of foretibia 48 µm long, spurs of midtibia 32 µm and 27 µm long, spurs of hind tibia 59 µm and 33 µm long. Width at apex of foretibia 26 µm, of midtibia 31 µm, of hind tibia 38 µm. Comb with 12 setae, longest 36 µm, shortest 25 µm long. Hypopygium (Figs 28–29): Tergite IX with 19 setae; laterosternite IX with 5 setae. Anal point broadly triangular, 25 µm long, 27 µm wide at base, 6 µm wide at apex. Phallapodeme 91 µm long including oral projection; transverse sternapodeme 107 µm long, gently arched. Virga 111 µm long, with well developed lateral lamellae. Gonocoxite 163 µm long. Gonostylus 86 µm long, widest medially, with long, low crista dorsalis; megaseta 6 µm long. HR 1.89; HV 2.59.

Distribution: This species is only known from the type locality.

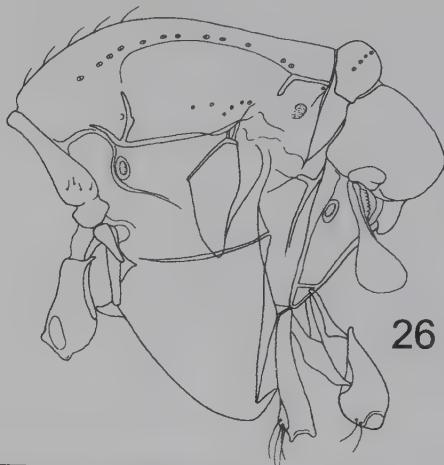
Etymology: From Latin *rostrum*, beak, snout, referring to the beak-like oral projection of the phallapodeme.

Genus *Psectrocladius* Kieffer, 1906

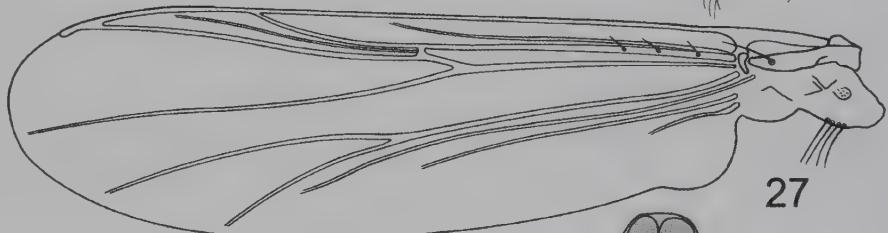
The genus is species rich and has a world wide distribution. Four subgenera are recognized. The larvae occur in a wide variety of aquatic habitats, predominantly in standing or slow flowing waters.



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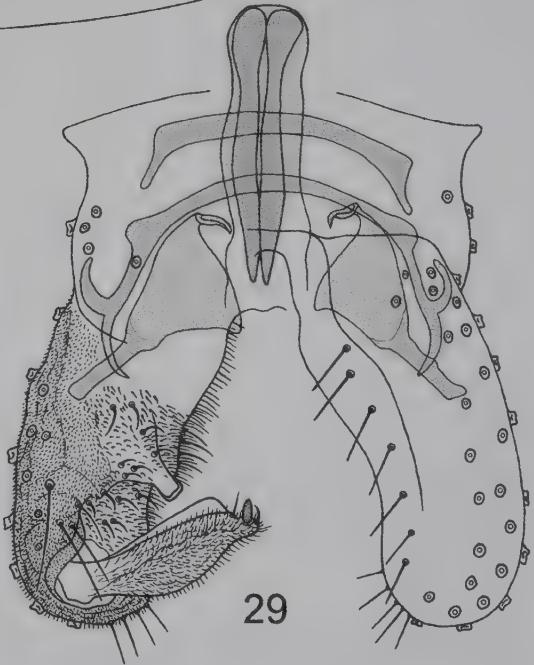
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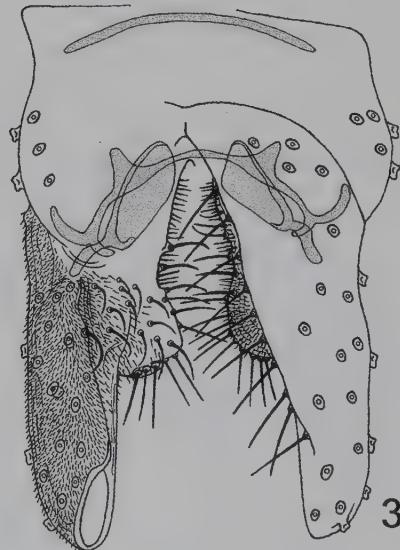
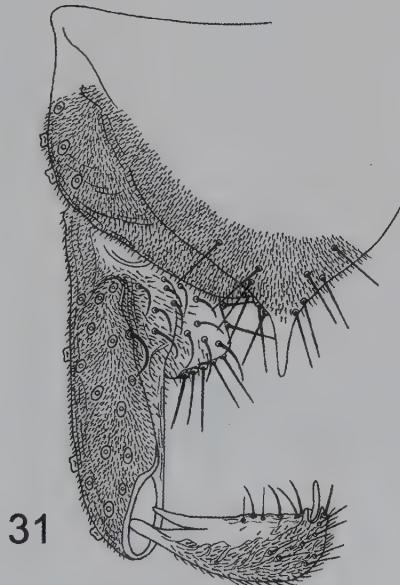


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Figures 25–29. *Bryophaenocladius rostratus* Andersen & Mendes nov. spec. 25: Tentorium, stipes, and cibarial pump; 26: Thorax; 27: Wing; 28: Hypopygium, dorsal view; 29: Hypopygium with tergite IX and anal point removed, dorsal view left, ventral view right.



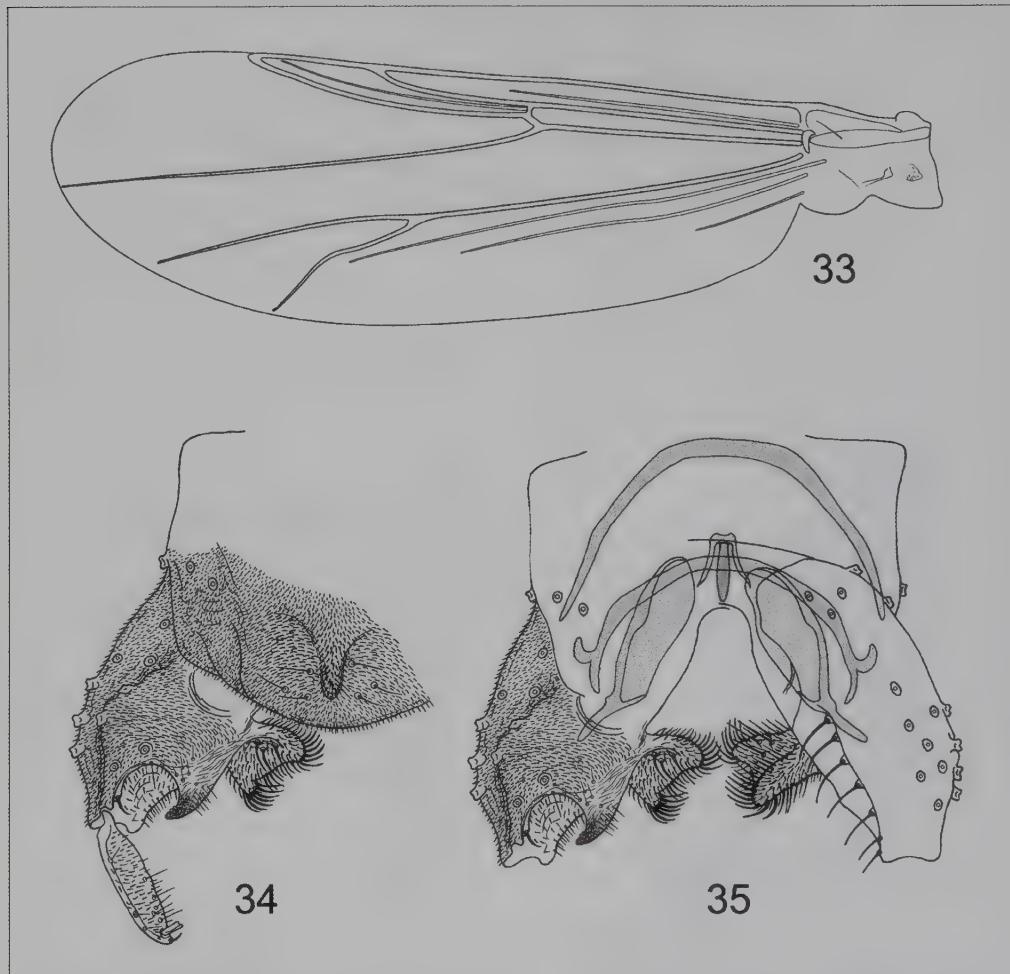
Figures 30–32. *Psectrocladius (P.) limbatellus* (Holmgren). 30: Wing; 31: Hypopygium, dorsal view; 32: Hypopygium with tergite IX and anal point removed, dorsal view left, ventral view right.

***Psectrocladius (Psectrocladius) limbatellus* (Holmgren, 1869)**

Specimens examined: Sharjah Desert Park, 1♂, 9–21.iii.2005, LT; 1♂, 30.iv–7.v.2005, LT; 1♂, 30.iv–31.v.2005, LT.

Diagnosis, male ($n = 3$): Total length 2.61–3.59 mm. Wing length 1.28–1.74 mm. Total length / wing length 2.04–2.28. Wing length / length of profemur 2.41–2.49. Colouration: Thorax pale with dark areas on scutum, preepisternum, and postnotum. Wing translucent. Legs amber becoming gradually darker towards tarsomere 5; apex of tibiae dark. Abdomen light brown. Head: AR 1.61 (1). Wing (Fig. 30): VR 1.24–1.27. Foreleg: LR₁ 0.70 (1); profemur 516 (1) µm long. Hypopygium (Figs 31–32): Tergite IX with 11–17 setae; laterosternite IX with 5–7 setae. Anal point 24–36 µm long, 10–14 µm wide at base, 3–6 µm wide at apex. Phallapodeme 79–98 µm long; transverse sternapodeme 70–107 µm long. Virga absent. Gonocoxite 218–265 µm long. Gonostylus 91–109 µm long; megaseta 12–16 µm long. HR 2.29–2.44; HV 3.29–3.71.

Figures 30–32



Figures 33–35. *Pseudosmittia danconai* Marcuzzi. 33: Wing; 34: Hypopygium, dorsal view; 35: Hypopygium with tergite IX removed, dorsal view left, ventral view right.

Distribution: The species is widely distributed in the Nearctic and West Palaearctic regions including North Africa and the Near East (Sæther & Spies, 2004). It is previously recorded from Saudi Arabia on the Arabian Peninsula (Cranston & Judd, 1989).

Genus *Pseudosmittia* Goetghebuer, 1932

The genus is very species rich and has a world wide distribution. Most species are terrestrial or semiterrestrial, a few have aquatic immatures.

Pseudosmittia danconai Marcuzzi, 1947

Specimens examined: Al-Ajban, 8♂, 21–28.xii.2005, LT & MT.

Diagnosis, male (n = 5): Total length 1.53–1.69, 1.64 mm. Wing length 857–1013, 932 µm. Total length / wing length 1.70–1.79, 1.76. Wing length / length of profemur 2.88–3.14, 3.01.

Figures 33–35

Colouration: Thorax dark brown. Wing translucent. Legs brown, tarsi slightly paler than femora and tibiae. Abdomen light brown. Head: AR 0.98–1.10, 1.05. Wing (Fig. 33): VR 1.41–1.55, 1.48. Foreleg: LR₁ 0.42–0.46, 0.44; profemur 295–322, 309 µm long. Hypopygium (Figs 34–35): Tergite IX with 4–7, 6 setae; laterosternite IX with 3–4, 3 setae. Phallapodeme 70–79, 74 µm long; transverse sternapodeme 50–61, 55 µm long. Virga 27–34, 31 µm long. Gonocoxite 109–122, 117 µm long. Gonostylus 49–53, 51 µm long; megaseta 5–7, 6 µm long. HR 2.04–2.45, 2.36; HV 3.00–3.47, 3.22.

Distribution: The species is distributed in Europe, Africa, and in the Near East (Sæther & Spies, 2004).

Subfamily **Chironominae** Macquart, 1838

Tribe **Chironomini** Macquart, 1838

Key to males

- 1** Wing membrane with macrotrichia, squama bare (tribe Tanytarsini) see Gilka (2009)
- Wing membrane without macrotrichia, squama with fringe (tribe Chironomini) **2**
- 2** Antenna with 11 flagellomeres **3**
- Antenna with 13 flagellomeres **10**
- 3** Inferior volsella absent or present, when present never with strong setae **4**
- Inferior volsella always present and with strong setae **5**
- 4** Inferior volsella present and digitiform (Fig. 68) *Microchironomus tener* (Kieffer)
- Inferior volsella absent (Fig. 50) *Cryptochironomus rostratus* Kieffer
- 5** Inferior volsella cylindrical or broadened subapically **6**
- Inferior volsella narrow in basal 2/3, apically wider and split in two more or less distinct lobes **8**
- 6** Inferior volsella cylindrical, with rounded apex **7**
- Inferior volsella distinctly broadened subapically (Fig. 65) *Kiefferulus disparilis* (Goetghebuer)
- 7** Palp strongly reduced, segments 3–5 partly fused (Fig. 36); superior volsella distally lobe-shaped (Fig. 43) *Baeotendipes ovazzai* (Freeman)
- Palp segments not reduced; superior volsella distally digitiform with hooked apex (Fig. 48) *Chironomus calipterus* Kieffer
- 8** Tergite IX with distinct, triangular lobes to each side of the anal point **9**
- Tergite IX, in dorsal view, without lobes to each side of the anal point (Fig. 52)..... *Dicrotendipes pallidicornis* (Goetghebuer)
- 9** Base of anal point constricted; inferior volsella apically deeply split in two lobes, basal lobe with single row of strong, spine-like setae (Figs 54–55) *Dicrotendipes peringueyanus* Kieffer
- Base of anal point broad; inferior volsella apically shallowly split in two lobes, basal lobe with two rows of strong, spine-like setae (Figs 60–61) *Dicrotendipes gilkai* Andersen & Mendes nov. spec.
- 10** Median volsella absent (Fig. 77); tergite VIII tapered anteriorly **11**
- Median volsella present (Figs 72 & 74); tergite VIII not tapered anteriorly *Paratendipes nudisquama* (Edwards)
- 11** Superior volsella distally with digitiform projections without microtrichia **12**
- Superior volsella subrectangular or pediform, with microtrichia **13**

- 12 Gonostylus widest subapically; digitiform projection of superior volsella weakly curved with strong setae medially (Figs 76 & 79) *Polypedilum (Polypedilum) alticola* Kieffer
- Gonostylus widest medially; digitiform projection of superior volsella nearly straight, without setae medially (Figs 80 & 83) *Polypedilum (Polypedilum) nubifer* (Skuse)
- 13 Superior volsella subrectangular 14
- Superior volsella pediform (Fig. 89) *Polypedilum (Tripodura) harteni* Andersen & Mendes nov. spec.
- 14 Anal point tapering (Fig. 90) *Polypedilum (Tripodura) bifurcatum* Cranston
- Anal point broadest subapically (Fig. 94) *Polypedilum (Tripodura) malickianum* Cranston

Genus *Baeotendipes* Kieffer, 1913

There is some uncertainty about the status of *Baeotendipes* since the larvae and pupae are indistinguishable from those of *Chironomus* (see Pinder & Reiss, 1986). The adults, however, can be distinguished from *Chironomus* on the reduced palp. Few included species. The larvae live in the sediments of saline lakes.

Baeotendipes ovazzai (Freeman, 1957)

Figures 36–43

Specimens examined: Al-Ajban, 1♂, 21–28.xii.2005, MT & LT. NARC, near Sweihan, 1♂, 14.iii–2.iv.2005, LT.

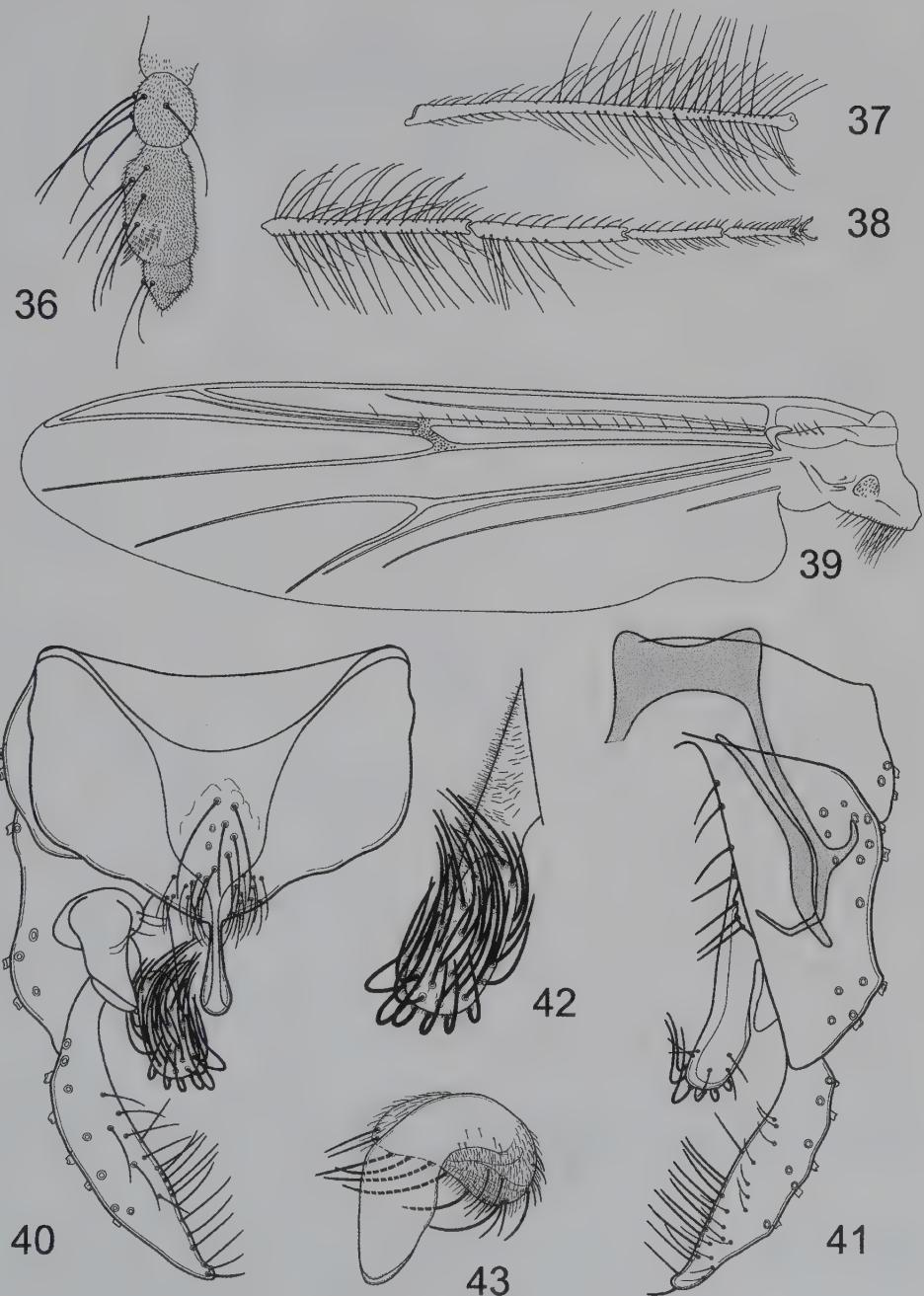
Diagnosis, male (n = 2): Total length 6.07–6.69 mm. Wing length 2.66–2.68 mm. Total length / wing length 2.26–2.52. Wing length / length of profemur 2.83–3.08. Colouration: Thorax pale, preepisternum, postnotum, median anepisternum II, and ventral part of scutellum dark brown. Wing translucent, RM darker than remaining veins. Legs amber, femora with dark apex, tibiae darker proximally, tarsi becoming gradually darker towards tarsomere 5. Abdomen dark brown. Head: AR 2.35 (1). Palp segments 3–5 partly fused, strongly reduced (Fig. 36). Wing (Fig. 39): VR 1.08–1.10. Foreleg: LR₁ 1.04, profemur 870–939 µm long. Foretarsi with ‘beard’ (Figs 37–38). Hypopygium (Figs 40–43): Tergite IX with 8–9 setae medially; laterosternite IX with 5–6 setae. Anal point 68–76 µm long, 14–16 µm wide at base, 25–49 µm wide at apex. Phallapodeme 191–223 µm long; transverse sternapodeme 90–126 µm long. Gonocoxite 274–287 µm long. Gonostylus 220–252 µm long. HR 1.09–1.29; HV 2.65–2.76.

Remarks: Both specimens from the UAE have a well developed beard on the foretarsi and a LR₁ of about 1. However, the AR is somewhat lower (2.35 compared to about 3.00) than in the Ethiopian specimens; and based on the figure of the hypopygium in Freeman (1957: fig 5a) the base of the anal point appears more narrow and the superior volsella distinctly shorter and wider.

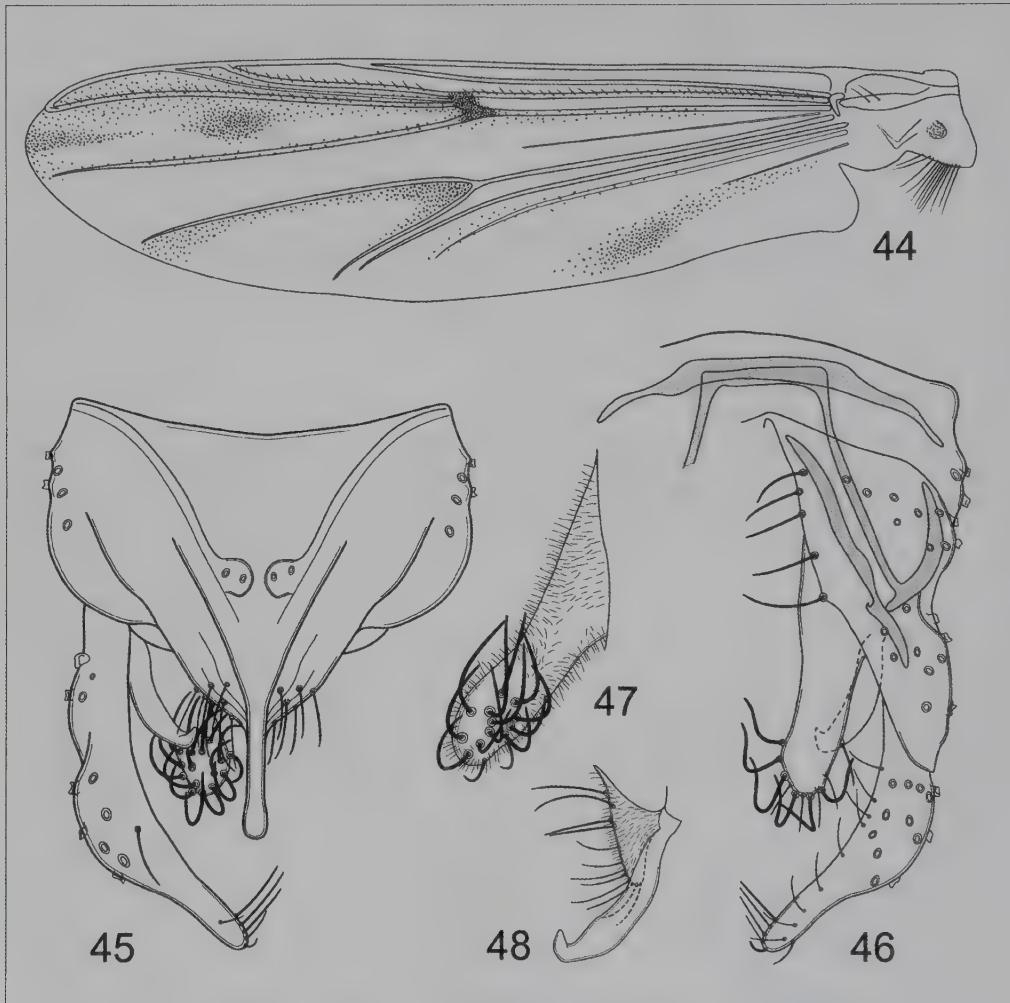
Distribution: The species was described as *Chironomus (Halliella) ovazzai* from Assab Salt Works in Ethiopia by Freeman (1957: 350). The species is not previously recorded from the Arabian Peninsula, but Martin et al. (2007) recorded a *Baeotendipes* larva from Saudi Arabia.

Genus *Chironomus* Meigen, 1803

The genus is very species rich and has a world wide distribution. Several subgenera are recognized, but the phylogeny of the *Chironomus* group of genera is not well understood (see e.g. Martin et al., 2007). The larvae occur in the sediments of most standing water bodies,



Figures 36–43. *Baeotendipes ovazzai* (Freeman). 36: Palp; 37: Foretarsus 1; 38: Foretarsi 2–5; 39: Wing; 40: Hypopygium, dorsal view; 41: Hypopygium, ventral view; 42: Inferior volsella; 43: Superior volsella.



Figures 44–48. *Chironomus calipterus* Kieffer. 44: Wing; 45: Hypopygium, dorsal view; 46: Hypopygium, ventral view; 47: Inferior volsella; 48: Superior volsella.

from pristine to severely polluted; some species are halophilous or halobionter. Male swarms of some species can attain nuisance proportions and are associated with allergic diseases.

Chironomus calipterus Kieffer, 1908

Specimens examined: Al-Ajban, 5♂, 17.x–9.xi.2005, MT; 5♂, 21–28.xii.2005, MT & LT. Fujairah, 2♂, 16–24.ii.2005, LT; 2♂, 24.ii–5.iii.2005, LT; 1♂, 6.iv–2.v.2005, LT; 4♂, 2.v–5.vi.2005, LT. Sharjah, 1♂, 1–31.i.2005, LT; 2♂, 1–10.ii.2005, LT. Sharjah Desert Park, 2♂, 18–25.i.2005, LT; 24♂, 25.i–22.ii.2005, LT; 1♂, 22.ii–9.iii.2005, LT; 5♂, 9–21.iii.2005, LT; 3♂, 30.iv–7.v.2005, LT. Wadi Maidaq, 14♂, 5–15.xii.2005, LT; 7♂, 27.xi–22.xii.2005, LT.

Diagnosis, male ($n = 5$): Total length 5.11–6.11, 5.61 mm. Wing length 2.38–3.00, 2.69 mm. Total length / wing length 2.01–2.21, 2.08. Wing length / length of profemur 2.36–2.57, 2.47. Colouration: Thorax pale, preepisternum, postnotum, median anepisternum II, and ventral

Figures 44–48

part of scutellum dark brown. Wing translucent, RM darker than remaining veins, membrane with darker areas. Legs amber, femora and tarsi 1–3 with dark ring at apex, tarsi 4–5 dark brown. Abdomen light brown, tergites I–IV with median dark area. Head: AR 2.86–3.30, 3.13. Wing (Fig. 44): VR 1.00–1.09, 1.05. Foreleg: LR₁ 1.47–1.71, 1.57; profemur 1008–1214, 1090 µm long. Hypopygium (Figs 45–48): Tergite IX with 4–8, 5 setae medially; laterosternite IX with 3–6, 5 setae. Anal point 70–81, 75 µm long; 11–22, 13 µm wide at base; 16–25, 19 µm wide at apex. Phallapodeme 112–154, 134 µm long; transverse sternapodeme 65–119, 84 µm long. Gonocoxite 209–241, 232 µm long. Gonostylus 126–158, 144 µm long. HR 1.52–1.68, 1.62; HV 3.58–4.13, 3.90.

Remarks: According to Cranston & Judd (1989) the species has been reported to cause nuisance at Zakhar al-Ain, UAE.

Distribution: The species was described from Namibia by Kieffer (1908: 158). It is widespread in the Afrotropical region; in the Palaearctic region it has a circum-Mediterranean distribution from Portugal and Spain to Syria, Israel and Jordan (Sæther & Spies, 2004). In the Arabian Peninsula it has been recorded from Saudi Arabia, Oman, and the UAE (Cranston & Judd, 1989).

Genus *Cryptochironomus* Kieffer, 1918

The genus is species rich and has a world wide distribution. The larvae occur in a wide variety of habitats including streams, rivers, and lakes.

Cryptochironomus rostratus Kieffer, 1921

Figures 49–51

Specimens examined: Sharjah Desert Park, 2♂, 25.i–22.ii.2005, LT.

Diagnosis, male (n = 2): Total length 4.85–5.38 mm. Wing length 2.20–2.31 mm. Total length / wing length 2.21–2.33. Wing length / length of profemur 2.80–2.82. Colouration: Thorax dark brown. Wing translucent. Legs amber; foreleg, mid- and hind femur dark brown. Abdomen brown, gradually paler towards hypopygium. Head: AR 3.24–3.26. Frontal tubercles small. Wing (Fig. 49): VR 1.09. Foreleg: LR₁ 1.68 (1); profemur 779–824 µm long. Hypopygium (Figs 50–51): Tergite IX without setae medially; laterosternite IX with 6–7 setae. Anal point 101–106 µm long, 25–36 µm wide at base, 14–16 µm wide at apex. Phallapodeme 115–119 µm long; transverse sternapodeme 65–72 µm long. Gonocoxite 187–202 µm long. Gonostylus 191–194 µm long. HR 0.96–1.06; HV 2.50–2.82.

Remarks: Both specimens from UAE have very small frontal tubercles, but appear to differ slightly from European specimens of *C. rostratus* in the shape of the anal point and in having a very small superior volsella and a rather narrow digitiform gonostylus (see Langton & Pinder, 2007a, b).

Distribution: The species is distributed in the Oriental and West Palaearctic regions, including North Africa and the Near East (Chaudhuri et al., 2001; Sæther & Spies, 2004). In the Arabian Peninsula it has been taken in Saudi Arabia (Cranston & Judd, 1989).

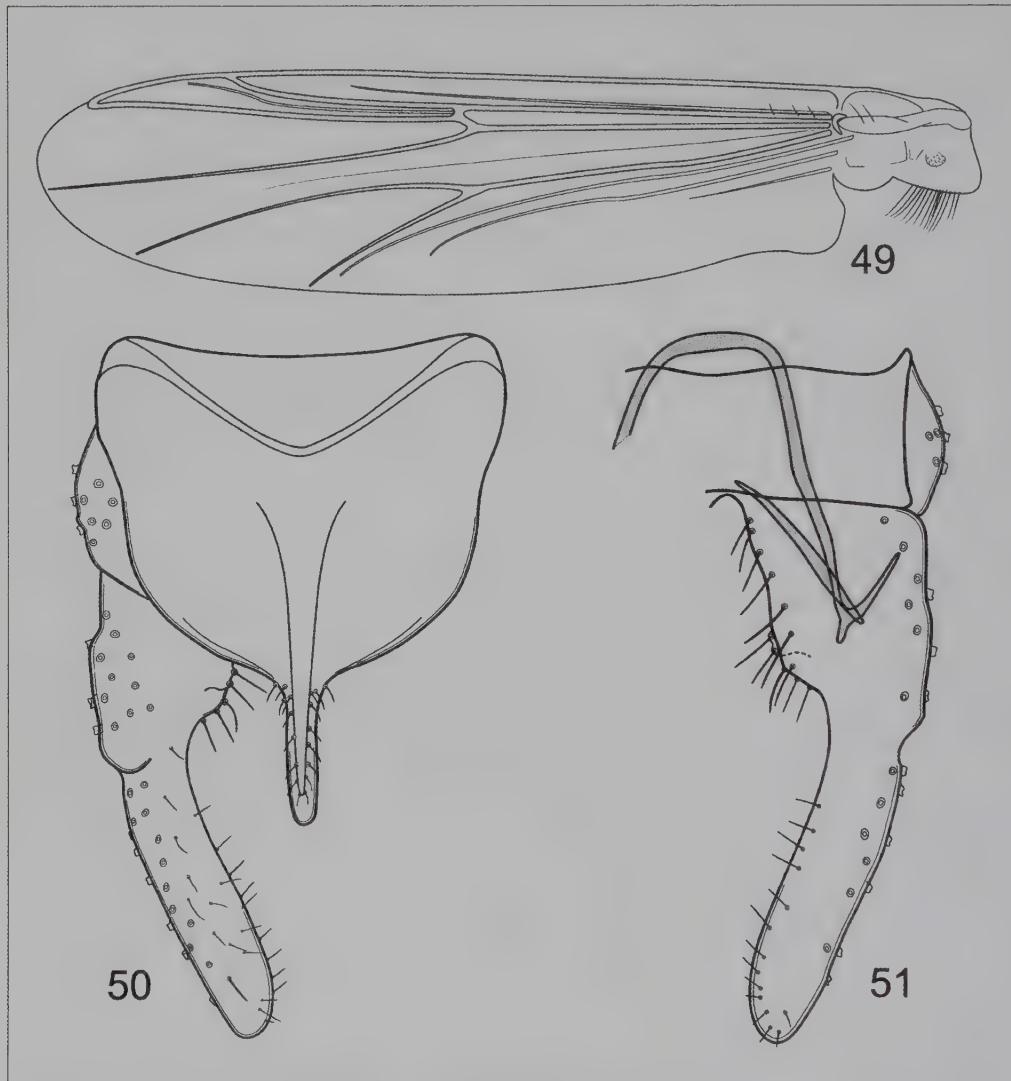
Genus *Dicrotendipes* Kieffer, 1913

The genus is species rich and has a world wide distribution. The larvae occur in a wide variety of standing waters.

Dicrotendipes pallidicornis (Goetghebuer, 1934)

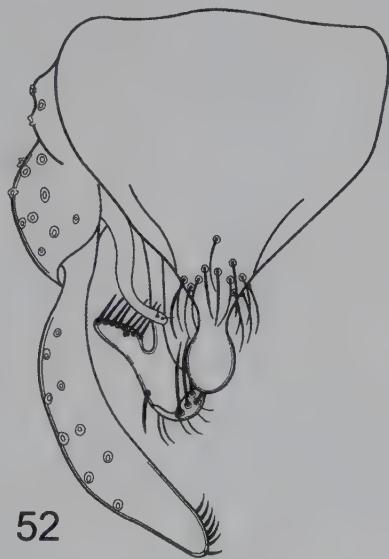
Figures 52–53

Specimens examined: Al-Ajban, 1♂, 17.x–9.xi.2005, MT; 1♂, 21–28.xii.2005, MT & LT. Wadi Wurayah, 1♂, 12–14.iv.2005, MT & WT.



Figures 49–51. *Cryptochironomus rostratus* Kieffer. 49: Wing; 50: Hypopygium, dorsal view; 51: Hypopygium, ventral view.

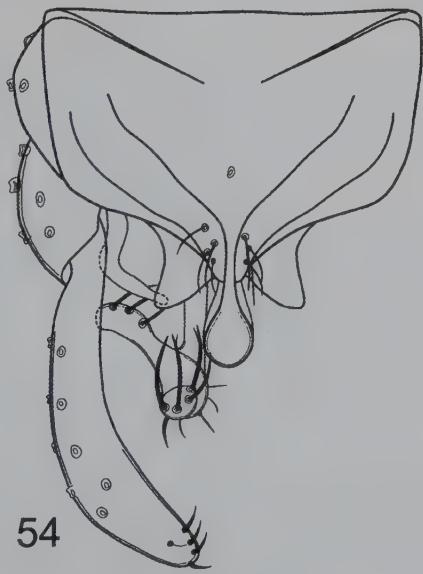
Diagnosis, male ($n = 3$): Total length 2.85–2.94 mm. Wing length 1.26–1.47 mm. Total length / wing length 1.99–2.26. Wing length / length of profemur 2.24–2.36. Colouration: Thorax brown. Wing translucent with darker shade at RM. Legs amber, forefemur and foretibia dark proximally and distally, mid- and hind legs light brown, tarsi gradually darker towards tarsomere 5. Abdomen brown. Head: AR 2.13–2.18. Wing: VR 1.06–1.09. Foreleg: LR₁ 1.87–1.93; profemur 562–645 μm long. Hypopygium (Figs 52–53): Tergite IX without setae medially; laterosternite IX with 3–4 setae. Anal point 35–43 μm long, 11 μm wide at base, 16–24 μm wide at apex. Phallapodeme 95–113 μm long; transverse sternapodeme 27–41 μm long. Gonocoxite 129–136 μm long. Gonostylus 127–147 μm long. HR 0.88–1.07; HV 1.99–2.28.



52



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54



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Figures 52–55. *Dicrotendipes pallidicornis* (Goetghebuer) (52–53) and *D. peringueyanus* Kieffer (54–55). 52 & 54: Hypopygium, dorsal view; 53 & 55: Hypopygium, ventral view.

Remarks: The species was redescribed by Contreras-Lichtenberg (1986) based on European specimens. The specimens from the UAE are smaller and the wing might be cloudier than in European specimens. However, the specimens from the UAE appear to be quite similar to European specimens in hypopygial features, and they have two broadly rounded lobes on the ventral side of tergite IX close to the base of the anal point; these flap-like appendages generally do not reach the margin of tergite IX and can thus not be observed in dorsal view.

Distribution: The species was described from Basra, Iraq as *Chironomus pallidicornis* by Goetghebuer (1934: 37). Elsewhere, the species is distributed in Europe and North Africa (Sæther & Spies, 2004).

***Dicrotendipes peringueyanus* Kieffer, 1924**

Figures 54–55

Specimens examined: Al-Ajban, 2♂, 21–28.xii.2005, MT & LT. Sharjah Desert Park, 1♂, 25.i–22.ii.2005, LT; 1♂, 22.ii–9.iii.2005, LT; 4♂, 30.iv–7.v.2005, LT; 5♂, 30.iv–31.v.2005, LT; 1♂, 30.vi–21.vii.2005, LT; 3♂, 21.vii–5.viii.2005, LT.

Diagnosis, male (n = 5): Total length 3.66–4.95, 4.48 mm. Wing length 1.81–2.24, 1.97 mm. Total length / wing length 1.90–2.54, 2.28. Wing length / length of profemur 2.45–2.80, 2.58. Colouration: Thorax pale, preepisternum, postnotum, median anepisternum II, and ventral part of scutellum dark brown. Wing translucent with dark areas. Legs amber, femora dark apically, tibiae dark proximally and distally, tarsi gradually darker towards tarsomere 5. Abdomen light brown with median dark area on tergites. Head: AR 2.48–3.00, 2.79. Wing: VR 1.00–1.07, 1.05. Foreleg: LR₁ 1.51–1.64, 1.56; profemur 687–916, 774 µm long. Hypopygium (Figs 54–55): Tergite IX with 0–1, 0 setae medially; laterosternite IX with 2–4, 3 setae. Anal point 47–65, 56 µm long; 16–22, 20 µm wide at base; 22–32, 28 µm wide at apex. Phallapodeme 130–148, 136 µm long; transverse sternapodeme 50–83, 62 µm long. Gonocoxite 173–202, 187 µm long. Gonostylus 166–212, 181 µm long. HR 0.95–1.09, 1.04; HV 0.85–1.08, 0.97.

Distribution: This species was described from the Cape Province in South Africa by Kieffer (1924: 257). It is widely distributed in the Afrotropical region, in North Africa, and in southern parts of Europe (Contreras-Lichtenberg, 1986; Epler, 1988). In the Arabian Peninsula it has been taken in Saudi Arabia (Cranston & Judd, 1989).

***Dicrotendipes gilkai* Andersen & Mendes nov. spec.**

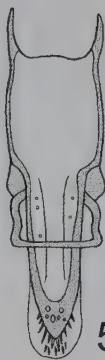
Figures 56–61, Table 2

Specimens examined: Holotype: ♂, United Arab Emirates, Sharjah Desert Park [25°17'N 55°42'E], 70 m a.s.l., 18–25.i.2005, LT, A. van Harten leg. (ZMBN). Paratypes: 2♂, as holotype but 25.i–22.ii.2005; 5♂, as holotype but 30.iv–7.v.2005; 1♂, as holotype but 30.iv–31.v.2005. 1♂, al-Ajban, 60 m a.s.l., 10–17.x.2005, MT. 1♂, Fujairah, 10 m a.s.l., 24.ii–05.iii.2005, LT. 1♂, Wadi Maidaq, 410 m a.s.l., 27.xi–22.xii.2005, LT.

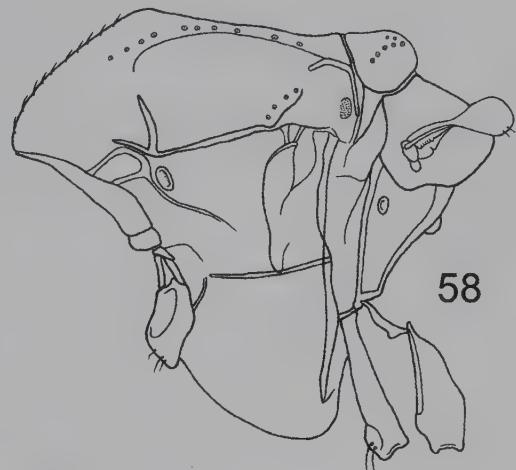
Diagnostic characters: The new species belong to the *D. septemmaculatus* group of species, and show similarities to *D. peringueyanus* and *D. sudanicus* (Freeman, 1957) in hypopygial features. It can be separated from both in having a comparatively broad-based anal point; gonostylus comparatively broad subapically; appendages to each side of the anal point well defined, narrowly triangular; superior volsella with distinct bend in basal 1/3 and slightly swollen medially; and apical part of inferior volsella less strongly bilobed with two rows of strong setae in basal half. The new species does not have distinctly spotted wings as in *D. pilosimanus* Kieffer, 1914, and *D. fusconotatus* Kieffer, 1922; it lacks a distinct spot in cell r₄₊₅ as in *D. peringueyanus*, and the male wing is more cloudy in cells r₄₊₅, m₃₊₄, and an and along the veins than in *D. sudanicus*.



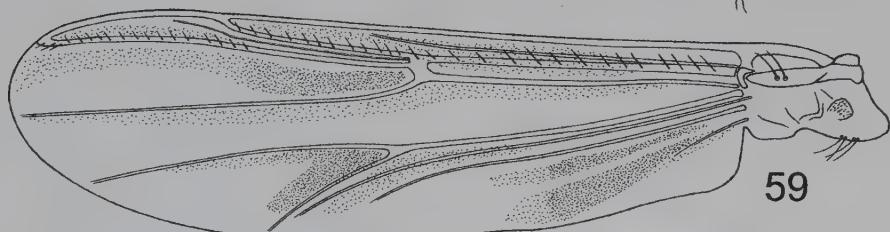
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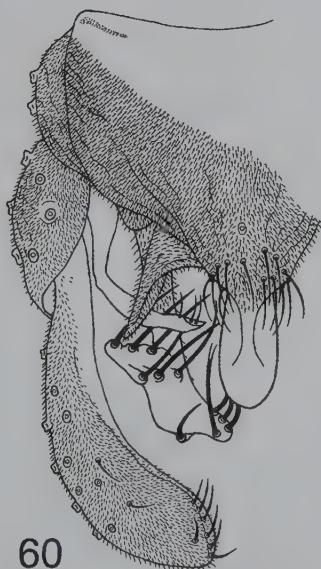
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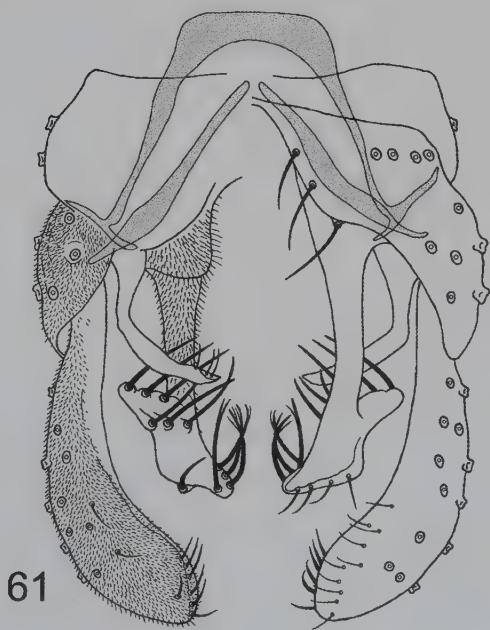
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Figures 56–61. *Dicrotendipes gilkai* Andersen & Mendes nov. spec. 56: Tentorium and stipes; 57: Cibarial pump; 58: Thorax; 59: Wing; 60: Hypopygium, dorsal view; 61: Hypopygium with tergite IX and anal point removed, dorsal view left, ventral view right.

Description, male ($n = 9$ – 10 , except when otherwise stated): Total length 2.91– 3.61 , 3.26 mm. Wing length 1.36– 1.70 , 1.55 mm. Total length / wing length 1.90– 2.30 , 2.12. Wing length / length of profemur 2.04– 2.36 , 2.12. Colouration: Thorax pale, preepisternum, postnotum, median anepisternum II and ventral parts of scutellum dark brown. Wing translucent with darker areas. Legs amber, forefemur and foretibia dark proximally and distally, mid- and hind legs light brown, tarsi gradually darker towards tarsomere 5. Abdomen uniformly brown. Head: AR 1.92– 2.19 , 2.04. Ultimate flagellomere 608– 706 , 644 μm long. Temporal setae 12– 23 , 17 including 7– 13 , 9 inner verticals, uniserial; 4– 11 , 6 outer verticals, uniserial; and 2– 3 , 2 postorbitalis, uniserial. Clypeus with 10– 20 , 15 setae. Frontal tubercles well developed, 12– 23 , 17 (7) μm long. Tentorium and stipes as in Figure 56; cibarial pump as in Figure 57. Tentorium 123– 170 , 144 μm long; 25– 38 , 29 μm wide. Stipes 147– 175 , 160 μm long; 41– 52 (3) μm wide. Palp segment lengths (in μm): 25– 34 , 29; 39– 54 , 45; 98– 150 , 120; 93– 145 , 122 (7); 184– 222 , 204 (6). Third palpomere with 2– 5 , 3 (7) sensilla; longest 12– 18 , 15 (7) μm long. Thorax (Fig. 58): Antepronotum with 0– 2 , 1 seta. Dorsocentrals 7– 17 , 11; acrostichals 9– 13 , 11, all decumbent and starting close to the antepronotum; prealars 3– 5 , 4; supraalar 0– 2 , 1. Scutellum with 8– 10 , 9 strong and 0– 7 , 4 weak setae. Wing (Fig. 59): VR 1.02– 1.22 , 1.12. Brachiolum with 2 setae; R with 11– 17 , 13 setae; R_1 with 6– 12 , 8 setae; R_{4+5} with 7– 18 , 12 setae; other veins and cells bare. Squama with 3– 7 , 4 setae. Anal lobe protruding. Legs: Spur of foretibia 29– 33 (3) μm long; spurs of midtibia 27– 32 , 29 (5) μm and 23– 27 , 25 (5) μm long; spurs of hind tibia 32– 36 , 33 (6) μm and 27– 32 , 30 (6) μm long. Comb of midtibia 16– 19 , 17 μm long; comb of hind tibia 16– 23 , 19 (6) μm long. Width at apex of foretibia 46– 50 (3) μm ; of midtibia 46– 57 , 51 (5) μm ; of hind tibia 54– 61 , 58 (6) μm . Lengths and proportions of legs as in Table 2. Hypopygium (Figs 60–61): Tergite IX with 14– 29 , 21 setae; laterosternite IX with 0– 5 , 1 setae. Anal point 41– 59 , 48 μm long; 10– 16 , 13 μm wide at base; 23– 28 , 24 μm wide at apex. Phallapodeme 98– 122 , 112 μm long; transverse sternapodeme 48– 73 , 55 μm long, nearly straight. Gonocoxite 150– 177 , 164 μm long. Inferior volsella 116– 138 , 128 μm long; 23– 32 , 27 μm wide at base; with 5– 13 , 9 strong and 5– 9 , 7 weaker setae apically. Superior volsella 66– 84 , 78 μm long; 12– 18 , 15 μm wide at base; 4– 7 , 6 μm wide at apex; with 2– 4 , 3 weak setae apically. Gonostylus 136– 160 , 148 μm long, widest apically. HR 1.01– 1.20 , 1.10; HV 2.08– 2.37 , 2.21.

Table 2. Lengths (in μm) and proportions of legs of *Dicrotendipes gilkai* Andersen & Mendes nov. spec., male (n : $p_1 = 3$; $p_2 = 5$, $p_3 = 6$).

	fe	ti	ta₁	ta₂	ta₃	ta₄
p₁	709–746	461–488	829–949	359–371	286 (1)	230 (1)
p₂	626–746, 678	562–654, 617	267–313, 292	138–166, 153	92–120, 109	55–83, 75
p₃	663–728, 701	709–783, 746	451–507, 475	225–267, 247	184–221, 201	101–120, 109
	ta₅		LR	BV	SV	BR
p₁	101 (1)		1.80–1.94	2.05 (1)	1.41 (1)	2.3–2.5
p₂	32–46, 43		0.46–0.51, 0.47	3.90–5.25, 4.21	4.12–4.66, 4.44	3.1–3.5, 3.2
p₃	55–64, 60		0.61–0.65, 0.63	2.98–3.24, 3.11	2.96–3.17, 3.05	3.2–4.8, 4.3

Distribution: The species is only known from the UAE.

Etymology: Named after Wojciech Giłka who sorted out the material.

Genus *Kiefferulus* Goethgebuer, 1922

The genus is distributed in the Holarctic, Afrotropical, Australian, and Oriental regions. The larvae are found in the sediments of predominantly small water bodies.

Kiefferulus disparilis (Goethgebuer, 1936)

Figures 62–66

Specimens examined: Sharjah Desert Park, 14♂, 25.i–22.ii.2005, LT; 2♂, 22.ii–9.iii.2005, LT; 2♂, 9–21.iii.2005, LT; 3♂, 30.iv–7.v.2005, LT; 3♂, 30.iv–31.v.2005, LT.

Diagnosis, male (n = 5): Total length 5.17–5.51, 5.33 mm. Wing length 2.36–2.91, 2.69 mm. Total length / wing length 1.80–2.19, 1.98. Wing length / length of profemur 2.45–2.74, 2.63.

Colouration: Thorax pale, preepisternum, postnotum, and ventral parts of scutellum dark brown. Wing translucent. Legs amber, foretibia dark proximally and distally, mid- and hind tibiae with dark ring proximally, tarsi gradually darker towards tarsomere 5. Abdomen light brown with median darker areas on tergites. Head: AR 2.75–2.97, 2.89. Wing (Fig. 62): VR 1.05–1.12, 1.09. Foreleg: LR₁ 1.40–1.48, 1.44; profemur 962–1076, 1021 µm long. Hypopygium (Figs 63–66): Tergite IX without setae medially; laterosternite IX with 0–1, 1 seta. Anal point 32–47, 40 µm long; 11–14, 12 µm wide at base; 18–22, 20 µm wide at apex. Phallapodeme 202–238, 218 µm long; transverse sternapodeme 79–137, 110 µm long. Gonocoxite 263–284, 274 µm long. Gonostylus 176–191, 183 µm long. HR 1.38–1.57, 1.50; HV 2.81–3.07, 2.91.

Remarks: According to Cranston & Judd (1989) the species has been reported to cause nuisance at Jeddah Sewage Works in Saudi Arabia.

Distribution: The species was described from Zaire as *Glyptotendipes disparilis* by Goethgebuer (1936: 462). It is widely distributed in Central Africa; in the Arabian Peninsula it has been taken in Saudi Arabia (Cranston & Judd, 1989).

Genus *Microchironomus* Kieffer, 1918

The genus has been recorded from the Holarctic, Afrotropical, Oriental and Australian regions. The immatures inhabit lakes, rivers and ditches, and are also known to occur in brackish water.

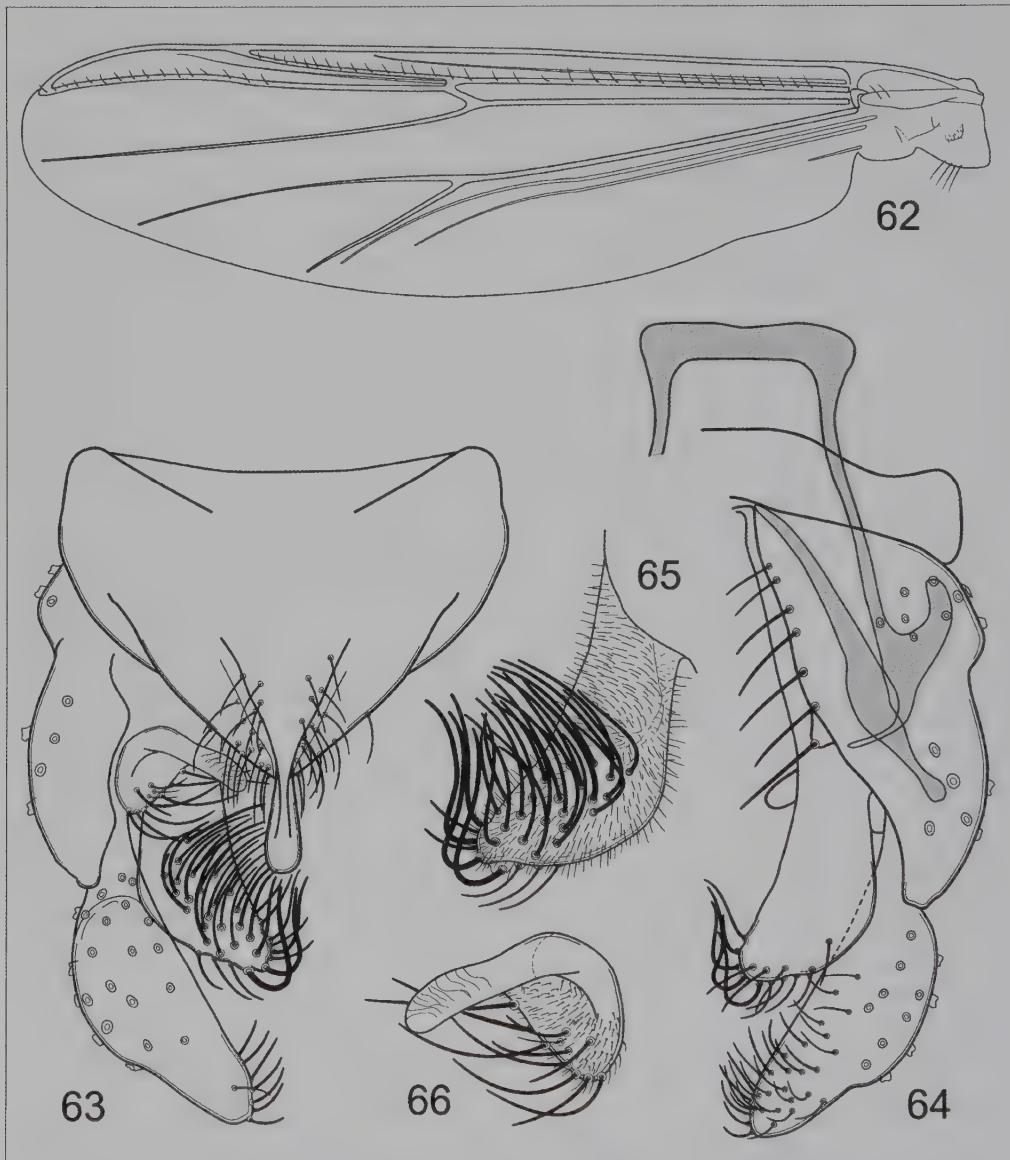
Microchironomus tener (Kieffer, 1918)

Figures 67–69

Specimens examined: Fujairah, 2♂, 2.v–5.vi.2005, LT. Sharjah Desert Park, 3♂, 18–25.i.2005, LT; 10♂, 25.i–22.ii.2005, LT; 8♂, 22.ii–9.iii.2005, LT; 4♂, 9–21.iii.2005, LT; 3♂, 30.vi–21.vii.2005, LT.

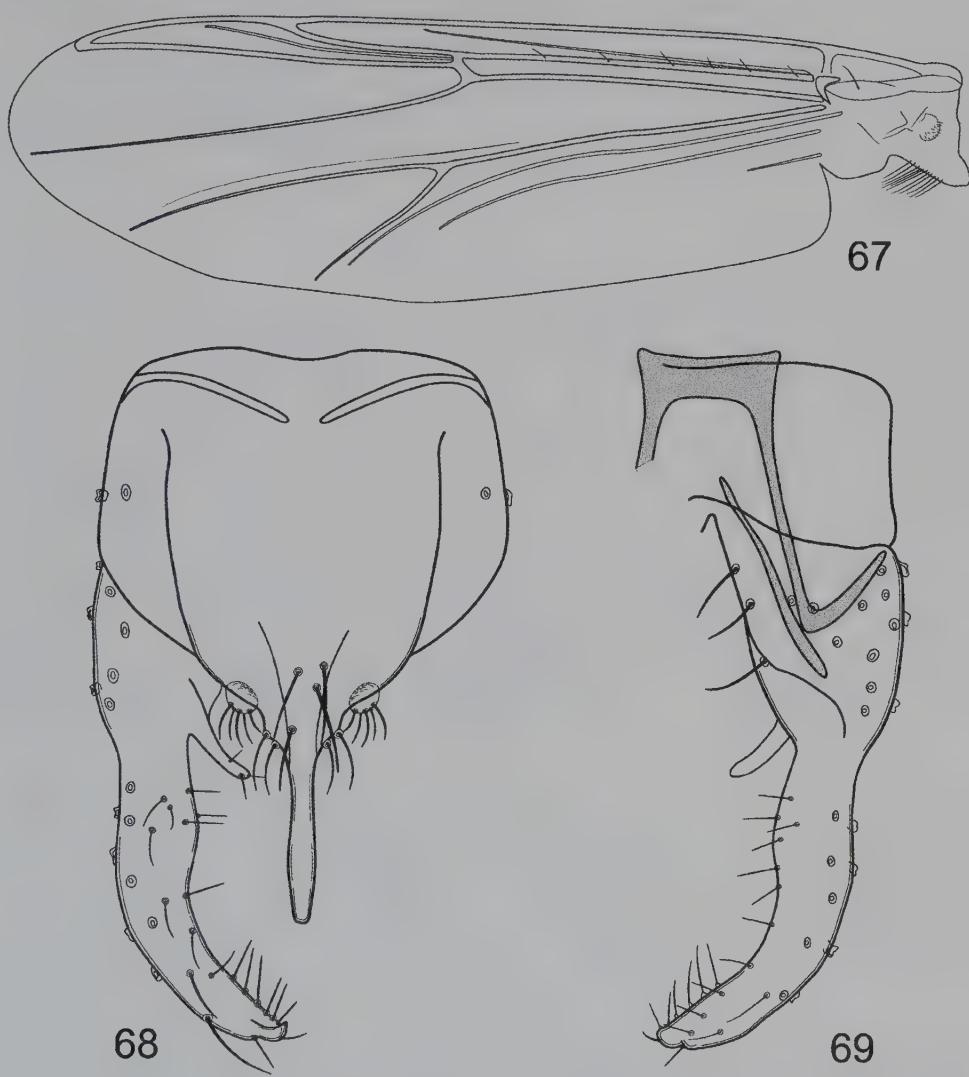
Diagnosis, male (n = 5): Total length 2.65–3.43, 3.06 mm. Wing length 1.11–1.50, 1.35 mm. Total length / wing length 2.12–2.47, 2.28. Wing length / length of profemur 2.27–2.62, 2.46.

Colouration: Thorax pale with dark areas on scutum and preepisternum, postnotum dark brown. Wing translucent. Legs amber, foretibia dark proximally and distally, tarsi gradually darker towards tarsomere 5. Abdomen light brown. Head: AR 1.77–1.93, 1.87. Wing (Fig. 67): VR 1.10–1.20, 1.15. Foreleg: LR₁ 1.56–1.66, 1.61; profemur 470–589, 547 µm long. Hypopygium (Figs 68–69): Tergite IX without setae medially; laterosternite IX with 1–3, 2 setae. Anal point 75–82, 78 µm long; 14–16, 15 µm wide at base; 7–8, 7 µm wide at apex. Phallapodeme 100–118, 108 µm long; transverse sternapodeme 48–66, 54 µm long. Gonocoxite 120–134, 128 µm long. Gonostylus 129–143, 142 µm long. HR 0.89–0.93, 0.90; HV 2.05–2.29, 2.16.



Figures 62–66. *Kiefferulus disparilis* (Goetghebuer). 62: Wing; 63: Hypopygium, dorsal view; 64: Hypopygium, ventral view; 65: Inferior volsella; 66: Superior volsella.

Distribution: The species was described from Poland as *Chironomus (Cryptochironomus) tener* by Kieffer (1918a: 48). The species is distributed in the Palaearctic region including North Africa, and in the Afrotropical, Australian and Oriental regions (Chaudhuri et al., 2001; Sæther & Spies, 2004). In the Arabian Peninsula it has been recorded from Saudi Arabia (Cranston & Judd, 1989).



Figures 67–69. *Microchironomus tener* (Kieffer). 67: Wing; 68: Hypopygium, dorsal view; 69: Hypopygium, ventral view.

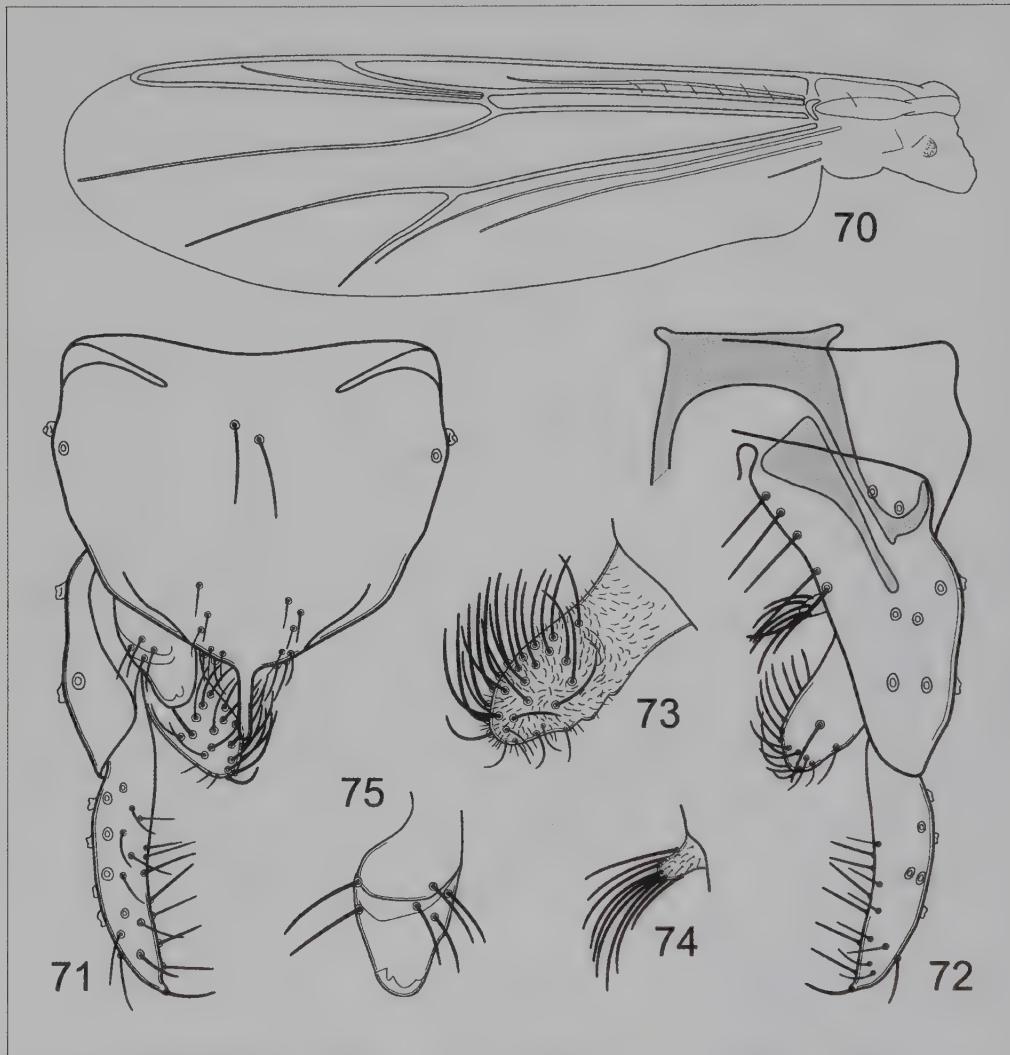
Genus *Paratendipes* Kieffer, 1911

The genus is species rich and has a world wide distribution. The immatures live in a wide variety of standing waters.

Paratendipes nudisquama (Edwards, 1929)

Specimens examined: Al-Ajban, 1♂, 9–16.xi.2005, MT & LT; 1♂, 21–28.xii.2005, MT & LT. Fujairah, 1♂, 16–24.ii.2005, LT. Sharjah Desert Park, 1♂, 9–21.iii.2005, LT; 3♂, 30.iv–31.v.2005, LT; 10♂,

Figures 70–75



Figures 70–75. *Paratendipes nudisquama* (Edwards). 70: Wing; 71: Hypopygium, dorsal view; 72: Hypopygium, ventral view; 73: Inferior volsella; 74: Median volsella; 75: Superior volsella.

21.vii–5.viii.2005, LT. Wadi Midaq, 2♂, 27.xi–22.xii.2005, LT. Wadi Wurayah, 1♂, 12–14.iv.2005, MT & WT.

Diagnosis, male (n = 5): Total length 2.47–2.81, 2.62 mm. Wing length 995–1529, 1245 µm. Total length / wing length 1.84–2.57, 2.15. Wing length / length of profemur 2.18–2.44, 2.30. Colouration: Thorax pale, preepisternum, postnotum, median anepisternum II, and ventral parts of scutellum dark brown. Wing translucent. Legs amber. Abdomen light brown, tergites II–VI with dark median areas. Head: AR 0.93–1.16, 1.06. Wing (Fig.70): VR 1.11–1.33, 1.21. Foreleg: Lost in all specimens. Hypopygium (Figs 71–75): Tergite IX with 2–5, 3 setae medially; laterostermite IX with 3–5, 4 setae. Anal point 25–32, 29 µm long; 6–9, 7 µm wide at base; 3–7, 5 µm wide at apex. Phallapodeme 64–73, 68 µm long; transverse sternapodeme

41–57, 50 µm long. Gonocoxite 123–132, 127 µm long. Gonostylus 66–82, 76 µm long. HR 1.55–1.93, 1.69; HV 3.05–3.75, 3.47.

Distribution: The species was described from the British Isles as *Chironomus (Paratendipes) nudisquama* by Edwards (1929: 396). The species is widely distributed in the Palaearctic region including North Africa, and in the Nearctic and Neotropical regions (Sæther & Spies, 2004). In the Arabian Peninsula it has been recorded from Saudi Arabia and Oman (Cranston & Judd, 1989).

Genus *Polypedilum* Kieffer, 1912

The genus is very species rich and has a world wide distribution. Five subgenera are recognized. The larvae are found in all standing and flowing waters, except at high latitudes and altitudes. The adults can attain nuisance numbers in disturbed habitats.

Polypedilum (Polypedilum) alticola Kieffer, 1913

Figures 76–79

Specimens examined: Wadi Wurayah, 1♂, 12–14.iv.2005, MT & WT.

Diagnosis, male (n = 1): Total length 4.16 mm. Wing length 2.09 mm. Total length / wing length 1.99. Wing length / length of profemur 2.27. Colouration: Thorax dark brown. Wing translucent with darker areas. Legs amber. Abdomen dark brown. Head: AR 1.46. Wing: VR 1.07. Foreleg: LR₁ 1.49; profemur 921 µm long. Hypopygium (Figs 76–79): Tergite IX with 10 setae medially; laterosternite IX with 3 setae. Anal point 93 µm long, 23 µm wide at base, 8 µm wide at apex. Phallapodeme 75 µm long; transverse sternapodeme 57 µm long. Gonocoxite 186 µm long. Gonostylus 152 µm long. HR 1.22; HV 2.74.

Distribution: The species was described from Kenya by Kieffer (1913: 22) and is widespread in the Afrotropical region. It has been recorded from India (Chaudhuri et al., 2001) and from Saudi Arabia (Cranston & Judd, 1989).

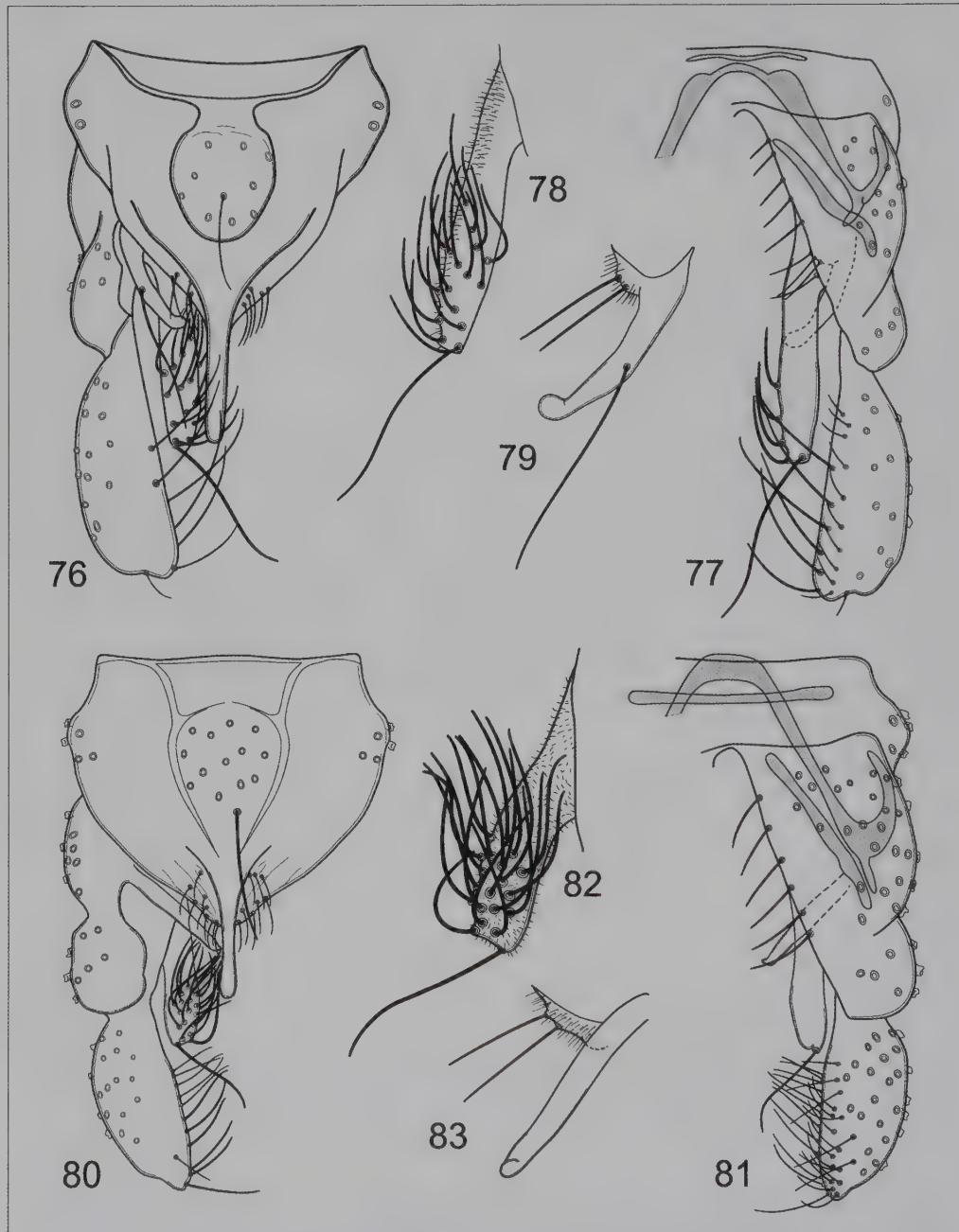
Polypedilum (Polypedilum) nubifer (Skuse, 1889)

Figures 80–83

Specimens examined: Al-Ajban, 14♂, 17.x–9.xi.2005, MT. Fujairah, 12♂, 2.v–5.vi.2005, LT. Sharjah Desert Park, 2♂, 18–25.i.2005, LT; 42♂, 25.i–22.ii.2005, LT; 4♂, 22.ii–9.iii.2005, LT; 2♂, 9–21.iii.2005, LT; 3♂, 30.iv–7.v.2005, LT; 5♂, 30.iv–31.v.2005, LT; 4♂, 30.vi–21.vii.2005, LT; 5♂, 21.vii–5.viii.2005, LT; 1♂, 20.x–8.xi.2005, LT.

Diagnosis, male (n = 5): Total length 3.29–5.43, 4.10 mm. Wing length 1.59–2.60, 2.04 mm. Total length / wing length 1.88–2.10, 2.01. Wing length / length of profemur 2.50–2.63, 2.56. Colouration: Thorax dark brown. Wing translucent, with darker areas. Legs amber, femora and tarsi 4–5 amber to light brown. Abdomen dark brown. Head: AR 2.06–2.63, 2.39. Wing: VR 1.10–1.34, 1.17. Foreleg: LR₁ 1.36–1.46, 1.42; profemur 617–1032, 833 µm long. Hypopygium (Figs 80–83): Tergite IX with 7–14, 11 setae medially; laterosternite IX with 4–6, 5 setae. Anal point 49–68, 57 µm long; 11–14, 12 µm wide at base; 9–14, 12 µm wide at apex. Phallapodeme 108–154, 132 µm long; transverse sternapodeme 36–54, 46 µm long. Gonocoxite 180–256, 211 µm long. Gonostylus 108–154, 131 µm long. HR 1.50–1.73, 1.61; HV 2.85–3.53, 3.11.

Distribution: The species is distributed in the Palaearctic region from southern Europe and North Africa through Egypt, Syria, and Iraq to Japan and North Korea; in the Oriental region from Pakistan, India, Sri Lanka and Indonesia to Taiwan; and in the Austropacific region in Australia and Micronesia. In the Arabian Peninsula it has been recorded from Saudi Arabia, Oman, and Qatar (Cranston & Judd, 1989).



Figs 76–83. *Polypedidium (P.) alticola* Kieffer (76–79) and *P. (P.) nubifer* (Skuse) (80–83). 76 & 80: Hypopygium, dorsal view; 77 & 81: Hypopygium, ventral view; 78 & 82: Inferior volsella; 79 & 83: Superior volsella.

***Polypedilum (Tripodura) harteni* Andersen & Mendes nov. spec.** Figures 84–89, Table 3

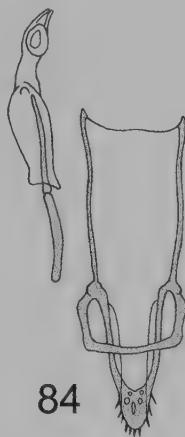
Specimens examined: Holotype: ♂, United Arab Emirates, al-Ajban [24°36'N, 55°01'E], 60 m a.s.l., 10–17.x.2005, MT, A. van Harten leg. (ZMBN). Paratypes: 2♂, as holotype but 9–16.xi.2005, MT & LT; 4♂, as holotype but 17.x–9.xi.2005. 1♂, Sharjah Desert Park, 18–25.i.2005, LT; 2♂, 21.vii–5.viii.2005, LT.

Diagnostic characters: The presence of wing markings, lack of lateral projections to each side of the anal point, and the pediform superior volsella distinguish the species from all other *Polypedilum* species.

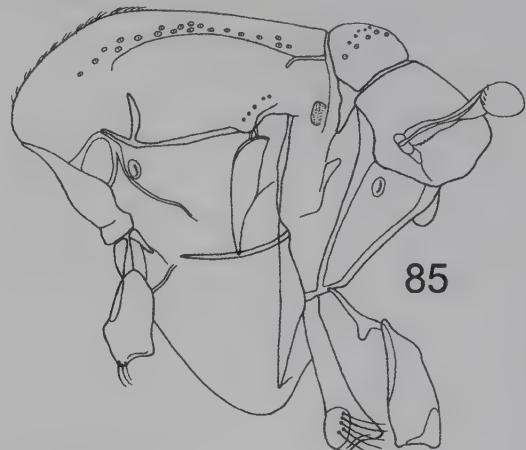
Description, male (n = 9–10, except when otherwise stated): Total length 1.82–2.93, 2.56 mm. Wing length 1.29–1.43, 1.36 mm. Total length / wing length 1.96–2.11, 2.04. Wing length / length of profemur 1.87–2.00, 1.97. Colouration: Thorax pale with dark areas on scutum, preepisternum, and postnotum. Wing translucent, with dark areas. Legs amber, femora with dark ring distally, tibiae with median and proximal darker areas. Abdomen light brown. Head: AR 0.92–0.99, 0.95. Ultimate flagellomere 349–392, 372 µm long. Temporal setae 9–11, 10 including 5–7, 6 inner verticals; 2–4, 3 outer verticals; and 0–1, 1 postorbital. Clypeus with 17–27, 21 setae. Tentorium, stipes and cibarial pump as in Figure 84. Tentorium 107–122, 116 µm long; 17–24, 20 µm wide. Stipes 107–143, 126 µm long; 32–38 (3) µm wide. Palp segment lengths (in µm): 23–29, 26; 29–41, 35; 79–102, 96; 102–116, 108; 125–191, 162. Third palpomere with 4–9, 6 sensilla; longest 13–20, 17 µm long. Thorax (Fig. 85): Antepronotum without setae. Dorsocentrals 16–20, 18; acrostichals 16–22, 20, all decumbent starting close to antepronotum; prealars 5–7, 6. Scutellum with 7–11, 9 strong and 6–16, 11 weak setae. Wing (Fig. 86): VR 1.14–1.26, 1.19. Brachiolum with 1 seta; R with 19–25, 22 setae; R₁ with 9–15, 12 setae; R₄₊₅ with 12–21, 19 setae; remaining veins and cells bare. Squama with 4–8, 6 setae. Legs: Scale of foretibia 25–34 (3) µm long; spur of midtibia 31–39, 35 (7) µm long; spur of hind tibia 34–41, 38 µm long. Comb of midtibia 16–21, 19 µm long, comb of hindtibia 16–23, 19 µm long. Width at apex of foretibia 45–47 (3) µm; of midtibia 45–51, 48 (7) µm; of hind tibia 50–57, 53 µm. Lengths and proportions of legs as in Table 3. Hypopygium (Figs 87–88): Tergite IX with 2–7, 4 setae medially and 18–24, 22 setae at base of anal point; laterosternite IX with 2–5, 3 setae. Anal point 50–61, 53 µm long; 10–16, 12 µm wide at base; 20–25, 23 µm wide at apex. Phallapodeme 109–132, 120 µm long; transverse sternapodeme 34–52, 46 µm long, nearly straight. Gonocoxite 147–170, 160

Table 3. Lengths (in µm) and proportions of legs of *Polypedilum (Tripodura) harteni* Andersen & Mendes nov. spec., male (n: p₁ = 3; p₂ = 7; p₃ = 10).

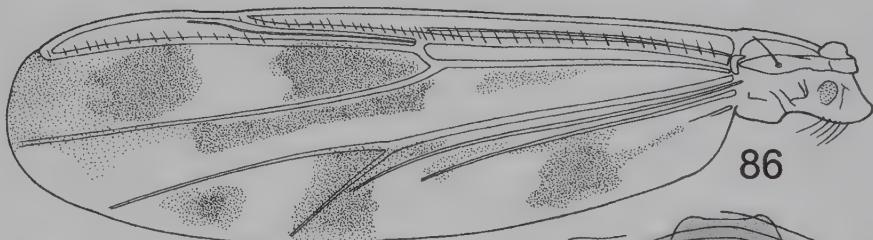
	fe	ti	ta ₁	ta ₂	ta ₃	ta ₄
p ₁	645–700	378–414	682–737	378–424	327–368	239–258
p ₂	682–755, 724	553–617, 587	267–304, 287	124–175, 140	92–101, 99	46–64, 56
p ₃	737–801, 768	608–691, 653	373–428, 407	184–221, 201	124–189, 173	83–101, 92
	ta ₅	LR	BV	SV	BR	
p ₁	74–97	1.71–1.80	1.64–1.65	1.50–1.55	2.7–3.3	
p ₂	28–41, 36	0.48–0.49, 0.48	4.28–5.09, 4.83	4.51–4.63, 4.57	2.5–3.8, 3.2	
p ₃	46–55, 51	0.61–0.63, 0.62	3.28–3.93, 3.55	3.43–3.60, 3.50	4.8–6.1, 5.4	



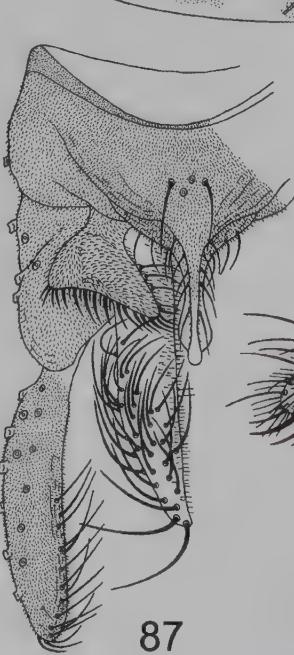
84



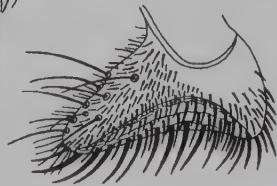
85



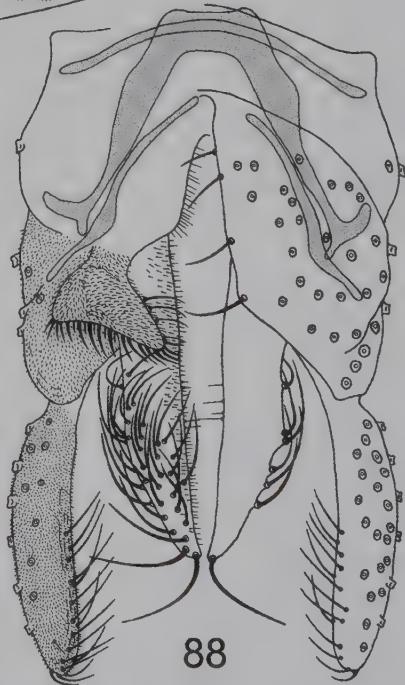
86



87



89



88

Figures 84–89. *Polypedilum (Tripodura) harteni* Andersen & Mendes nov. spec. 84: Tentorium, stipes, and cibarial pump; 85: Thorax; 86: Wing; 87: Hypopygium, dorsal view; 88: Hypopygium with tergite IX and anal point removed, dorsal view left, ventral view right; 89: Superior volsella, ventral view.

μm long. Inferior volsella 11–148, 127 μm long; 20–35, 28 μm wide at base. Superior volsella (Fig. 89), 57–66, 621 μm long; 19–33, 26 μm wide at base. Gonostylus 118–148, 133 μm long. HR 1.10–1.40, 1.22; HV 2.09–2.12, 2.11 (4).

Distribution: The species is only known from UAE.

Etymology: Named after Antonius van Harten, who collected the material.

Polypedilum (Tripodura) bifurcatum Cranston, 1989

Figures 90–93

Specimens examined: Al-Ajban, 2♂, 17.x–9.xi.2005, MT. Fujairah, 7♂, 2.v–5.vi.2005, LT. NARC, near Sweihan, 1♂, 14.iii–2.iv.2005, LT. Sharjah Desert Park, 1♂, 18–25.i.2005, LT; 4♂, 30.iv–7.v.2005, LT; 2♂, 30.iv–31.v.2005, LT; 25♂, 20.x–08.xi.2005, LT. Wadi Maidaq, 3♂, 27.xi–22.xii.2005, LT.

Diagnosis, male (n = 5): Total length 1.91–2.27, 2.07 mm. Wing length 1.05–1.23, 1.14 mm. Total length / wing length 1.70–1.98, 1.81. Wing length / length of profemur 2.11–2.42, 2.32.

Colouration: Thorax brown with darker areas on scutum, preepisternum, and postnotum. Wing translucent. Legs amber. Abdomen light brown. Head: AR 0.91–0.93, 0.92. Wing: VR 1.20–1.31, 1.26. Foreleg: LR₁ 2.22–2.36, 2.27; profemur 461–516, 494 μm long. Hypopygium (Figs 90–93): Tergite IX with 2–3, 3 setae medially; laterosternite IX with 3 setae. Anal point 34–41, 37 μm long; 3–5, 4 μm wide at base; 2–5, 3 μm wide at apex. Phallapodeme 73–79, 75 μm long; transverse sternapodeme 23–39, 29 μm long. Gonocoxite 104–120, 109 μm long. Gonostylus 116–139, 127 μm long. HR 0.80–0.90, 0.86; HV 1.55–1.79, 1.63.

Remarks: The species was transferred to the subgenus *Tripodura* Townes, 1945, by Vårdal et al. (2002).

Distribution: The species was described as *Polypedilum (Polypedilum) bifurcatum* from Tahwa near Sur in Oman by Cranston (1989: 227). The species is recorded from Oman and Saudi Arabia, and from Kenya in East Africa (Vårdal et al., 2002).

Polypedilum (Tripodura) malickianum Cranston, 1989

Figures 94–97

Specimens examined: Al-Ajban, 34♂, 21–28.xii.2005, MT & LT; 9♂, 10–17.x.2005, MT; 15♂, 17.x–9.xi.2005, MT; 10♂, 9–16.xi.2005, MT & LT. Sharjah Desert Park, 5♂, 18–25.i.2005, LT; 2♂, 30.vi–21.vii.2005, LT; 9♂, 21.vii–5.viii.2005, LT. Wadi Maidaq, 3♂, 27.xi–22.xii.2005, LT. Wadi Wurayah, 2♂, 12–14.iv.2005, MT & WT.

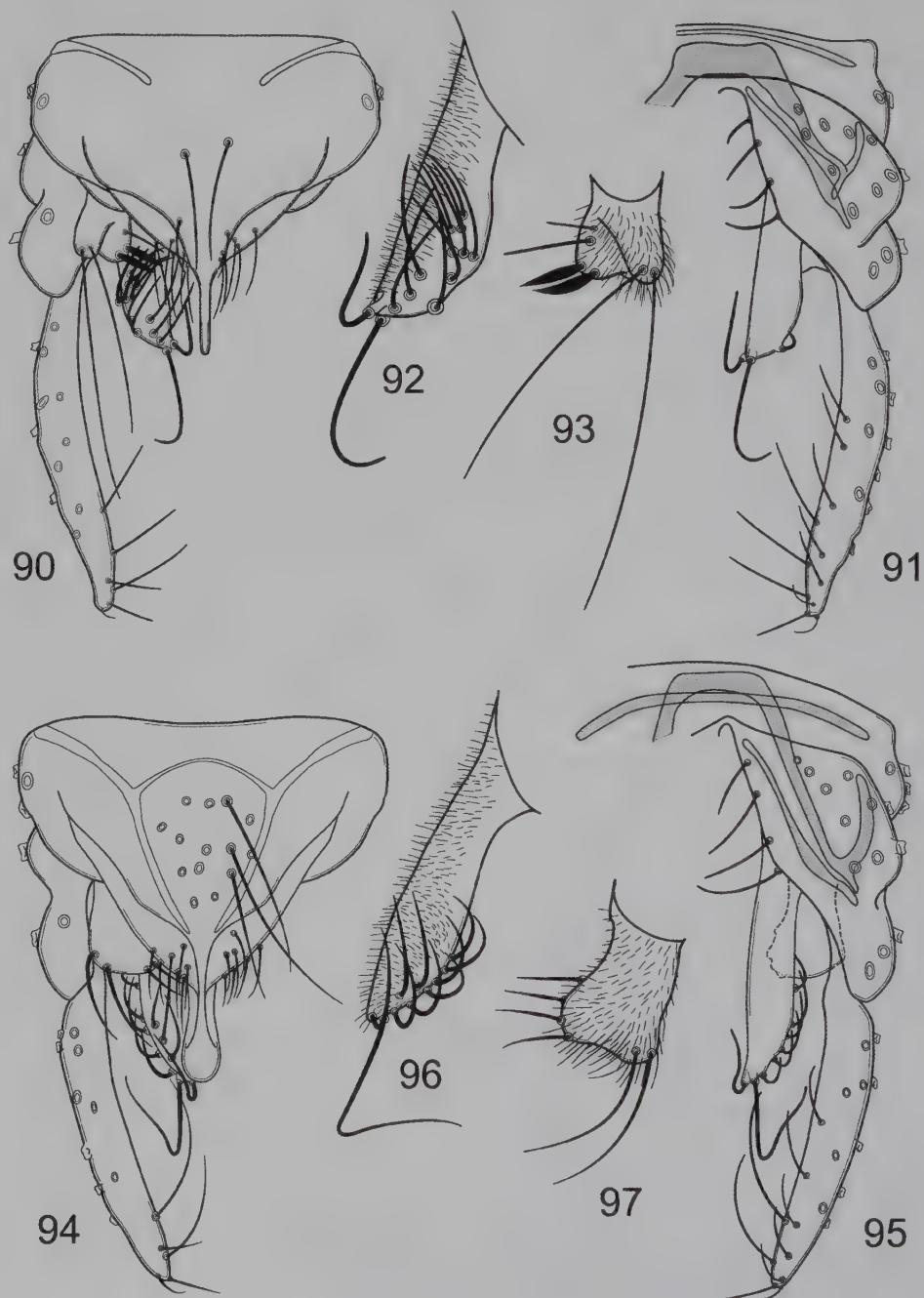
Diagnosis, male (n = 5): Total length 2.10–2.50, 2.34 mm. Wing length 1.07–1.37, 1.25 mm. Total length / wing length 1.81–1.97, 1.88. Wing length / length of profemur 2.00–2.33, 2.15.

Colouration: Thorax brown with postnotum dark brown. Wing translucent, with darker areas along major veins. Legs amber. Abdomen brown. Head: AR 1.27–1.44, 1.36. Wing: VR 1.24–1.30, 1.27. Foreleg: LR₁ 1.83–2.18, 1.94; profemur 534–608, 584 μm long.

Hypopygium (Figs 94–97): Tergite IX with 9–15, 13 setae medially; laterosternite IX with 2–4, 3 setae. Anal point 36–45, 42 μm long; 11–16, 15 μm wide at base; 16–26, 22 μm wide at apex. Phallapodeme 66–77, 71 μm long; transverse sternapodeme 25–34, 28 μm long. Gonocoxite 116–125, 119 μm long. Gonostylus 108–122, 118 μm long. HR 0.94–1.07, 1.01; HV 1.81–2.30, 2.00.

Remarks: The species was transferred to the subgenus *Tripodura* by Vårdal et al. (2002).

Distribution: The species was described as *Polypedilum (Polypedilum) malickianum* from Hofuf in Saudi Arabia by Cranston (1989: 229). The species is recorded from Greece (Crete and Rhodes), Algeria, and Saudi Arabia (Vårdal et al., 2002).



Figures 90–97. *Polyepidium (Tripodura) bifurcatum* Cranston (90–93) and *P. (T.) malickianum* Cranston (94–97). 90 & 94: Hypopygium, dorsal view; 91 & 95: Hypopygium, ventral view; 92 & 96: Inferior volsella; 93 & 97: Superior volsella.

ACKNOWLEDGEMENTS

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Order Diptera, family Cecidomyiidae

Galls induced by species of *Actilasioptera* Gagné on leaves of grey mangrove, *Avicennia marina*

Keith M. Harris and Antonius van Harten

INTRODUCTION

In February 2006, J.C. Deeming reared two adult gall midges from leaf galls on grey mangrove, *Avicennia marina*, collected in the United Arab Emirates, and sent them to the senior author (KMH), who identified them as a species of *Actilasioptera* Gagné, 1999. That genus was erected by Gagné (Gagné & Law, 1999; Gagné, 1999) to accommodate five new species that had been reared from leaf galls on *Avicennia marina* collected along the coast of Queensland, Australia in 1994–96, plus a sixth species known only from Java on Indian mangrove, *Avicennia officinalis*. Subsequent research indicates that at least three morphologically distinct species of *Actilasioptera* are present in the UAE. One of these may be *A. coronata* Gagné, a species otherwise known only from Australia, and the other two are probably new species that cannot be formally described until adults, larvae and pupae have been positively associated with the three gall types.

MATERIALS AND METHODS

Leaf galls were collected in the UAE on a number of occasions from two separate localities: Ra's al-Khaymah [25°46'N 55°58'E], on the west coast, and Khor Kalba [24°59'N 56°21'E], on the east coast. Fresh galls were then kept in the laboratory at Sharjah in polythene bags to rear adults and samples of galls were preserved in 70% ethanol for later dissection. Reared adults were preserved in 70% ethanol and examined and photographed by transmitted and phase-contrast microscopy in temporary mountants (phenol and lactophenol) and reference specimens were mounted in Euparal on microscope slides or stored in 70% ethanol in screw-top tubes. At first it was thought that only one gall type was involved but by early 2009, when field collections were made by Mathias and Catrin Jaschhof, it became clear that at least three different galls were present (Plates 1–3). Positive association of reared adults, larvae and pupae with the three gall types has proved difficult but collection of a few galls with adherent pupal exuviae has facilitated study of pupal characters. Larvae were retrieved from two of the gall types but are yet to be obtained from the third. The field work and laboratory rearing in UAE was mostly undertaken by the junior author (AvH) and morphological examination of adults, larvae, pupae and pupal exuviae was undertaken in the United Kingdom by KMH. Voucher specimens will be deposited in The Natural History Museum, London.

TAXONOMIC ACCOUNT

The genus *Actilasioptera* is well-characterised by a unique combination of adult and pupal characters : the female ovipositor is aciculate, adapted to pierce plant tissues (Plate 4) and the enlarged pupal vertex lacks vertical papillae and setae (Plates 6 and 7). Other apomorphies noted by Gagné include the narrow, elongate parameres and aedeagus in male genitalia (Plate 5); reduction of the maxillary palpi to one or two segments; reduction in the size of the larval



1



2

Plates 1–2. Galls of *Actilasioptera* species. 1: Species A, showing upper and lower leaf surfaces, Khor Kalba, 23.ii.2009. 2: Species B, on underside of leaf, Ra's al-Khaymah, 3.iii.2009. (Photographs by M. & C. Jaschhof)



Plate 3. Galls of *Actilasioptera* species. 3: Species B (top right) and species C (bottom left) on undersides of leaf, Ra's al-Khaymah, 3.iii.2009. (Photograph by M. & C. Jaschhof)

sternal spatula; reduction of the larval thoracic lateral papillae to three pairs from four and reduction of the terminal papillae to one pair from four. So far as can be established with available specimens, the three species from the United Arab Emirates meet these criteria.

Key to species of *Actilasioptera* currently known to occur in the United Arab Emirates.

- 1 Very small species, pupal exuviae 1.0–1.2–1.3 mm. long (n=7), inducing small, flat, round, ocellate pustule galls, about 1.5–2.0 mm diameter, in leaf lamina.. Pupal antennal sheaths with short sclerotised processes *Actilasioptera* spec. C
- Larger species, pupal exuviae more than 1.5 mm. long, pupal antennal sheaths without sclerotised processes 2
- 2 Galls hard, thick-walled, about 2.0–2.5 mm diameter, hemispherical above and crater-like below *Actilasioptera* spec. A
- Galls flat, circular pustules, about 5.0–8.0 mm. diameter, with dark central chamber..... *Actilasioptera* spec. B

***Actilasioptera* species A**

Circular, unilocular galls in leaf lamina, 2.0–2.5 mm in diameter, hemispherical on upper leaf surface and mature gall with thick-walled chamber raised into crater-like protrusion on the lower surface, containing single larvae which pupate within the galls. Adults emerge from



4



5

Plates 4–5. 4: *Actilasioptera* spec., lateral view of abdomen showing retracted aciculate ovipositor. Ra's al-Khaymah, 25.iii.2008; 5: *Actilasioptera* spec., dorsal view of aedeagus, parameres and gonostyles.



Plate 6. *Actilasioptera* spec., female pupa 20592, Khor Kalba, 24.ii.2009, collected by M. & C. Jaschhof, frontal view showing enlarged vertex and absence of vertical setae.

exit holes on undersides of galls, leaving pupal exuviae protruding. Live adult body colour is generally pinkish-orange, lacking dark scales on abdominal tergites. This gall is similar to the gall induced by *Actilasioptera coronata* Gagné, 1999, currently known only from north-eastern Australia. This is the most abundant of the three species. It has been recorded at Ra's al-Khaymah and Khor Kalba and was initially considered to be the only species present. Adult emergence has been recorded in February and March and the species is probably univoltine.

Actilasioptera species B

Circular, unilocular blister gall in leaf lamina, raised slightly above the leaf surface on both the upper and lower sides. It is larger than gall A, with a diameter of about 5.0–8.0 mm. Each gall contains a single larva contained in a central black carbonaceous chamber from which



Plate 7. *Actilasioptera* spec., female pupa 20592, Khor Kalba, 24.ii.2009, collected by M. & C. Jaschhof, lateral view showing enlarged vertex and absence of vertical setae.

the larva cuts a black operculum before pupation and emergence. It is less common than species A but may be locally abundant. It has been recorded at Ra's al-Khaymah and Khor Kalba and adult emergence in February and March coincides with emergence of species A.

Actilasioptera species C

Unilocular pustule galls in leaf lamina, smaller than galls A and B, with diameter of about 1.5–2.0 mm, with an outer circle of dark tissue giving the appearance of an eyespot. Pupal exuviae are very small, less than 1.5 mm long, protruding from galls and with sclerotised processes on antennal sheaths. It has been recorded only once and in small numbers at Ra's al-Khaymah, 03.iii.2009, (leg. M. & C. Jaschhof) but may have been overlooked in earlier collections when it was thought that only one or two species of *Actilasioptera* were involved. The presence of pupal exuviae attached to these galls indicates that adults had emerged recently but no adults have actually been reared from galls. The small size of the pupal exuviae indicates that this is the smallest of the three species. Catches of adult *Actilasioptera* swept from mangrove by Mathias Jaschhof at Khor Kalba on 23/24.ii.2009 may include this species but the galls are yet to be found at that locality.

DISCUSSION

There is an obvious need for further study of the interesting interaction between the genus *Actilasioptera* and *Avicennia marina* both in the UAE and elsewhere throughout the wider geographical range of the host plant. This gall midge genus seems well adapted to survive in harsh tropical/sub-tropical littoral marine environments and provides an interesting case of co-evolution that has given rise to a number of distinct species inducing various leaf galls. Local studies should first concentrate on recognising the different gall types, which are likely to be diagnostic of the species, and should then associate larvae, pupae and reared adults with each gall type. This must involve careful rearing from individual galls as galls of different species may occur together on the same leaf so that mass-rearing of adults from large samples may fail to provide positive associations. Current studies on the material collected in the UAE, and the previous studies of Gagné & Law (1998) indicate that diagnostic morphological characters are likely to be found in larvae, where the sternal spatulae may be distinctive, and in pupae, where modifications of the vertex and of the armature of the antennal sheaths and facial area may be diagnostic.

ACKNOWLEDGEMENTS

We especially thank Mathias and Catrin Jaschhof for critical observations and collections made during their visit to the UAE in February 2009, which revealed the presence of three different gall types. Plates 1–3 are reproduced with their permission.

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Order Diptera, family Rhagionidae

John C. Deeming

INTRODUCTION

The Rhagionidae (formerly known as Leptidae) is a family of flies of worldwide distribution (with the exception of Antarctica), having about 500 known species and with very little-known biology. Adult *Rhagio* are to be found sitting head-downwards on the trunks of trees and are predaceous on other insects. Their larvae and pupae are to be found in damp soil rich in decaying organic matter. Keys to the identification of Palaearctic species are given by Szilady (1934), distributions by Majer (1988) and an introduction to the family by Majer (1997).

MATERIALS AND METHODS

The single specimen, which lacks its antennae, has been dried from alcohol, being passed through absolute ethanol and ethyl acetate. It is preserved in the collections of the National Museum of Wales.

TAXONOMIC ACCOUNT

Rhagio conspicuus (Meigen, 1804)

Specimens examined: Qurayyah, 1♂, 19.iii.2007, with sweepnet, leg. F. Menzel & A. Stark.

Remarks: I most strongly doubt that this specimen originated in the UAE, the choice of habitats being unsuitable for its survival. It is much more likely to have been translocated there by heavy air disturbance.

Distribution: Europe and Russia. There are as yet no records from Arabia.

ACKNOWLEDGEMENTS

My thanks are due to the collectors of the specimen and to James Turner for photographing it.

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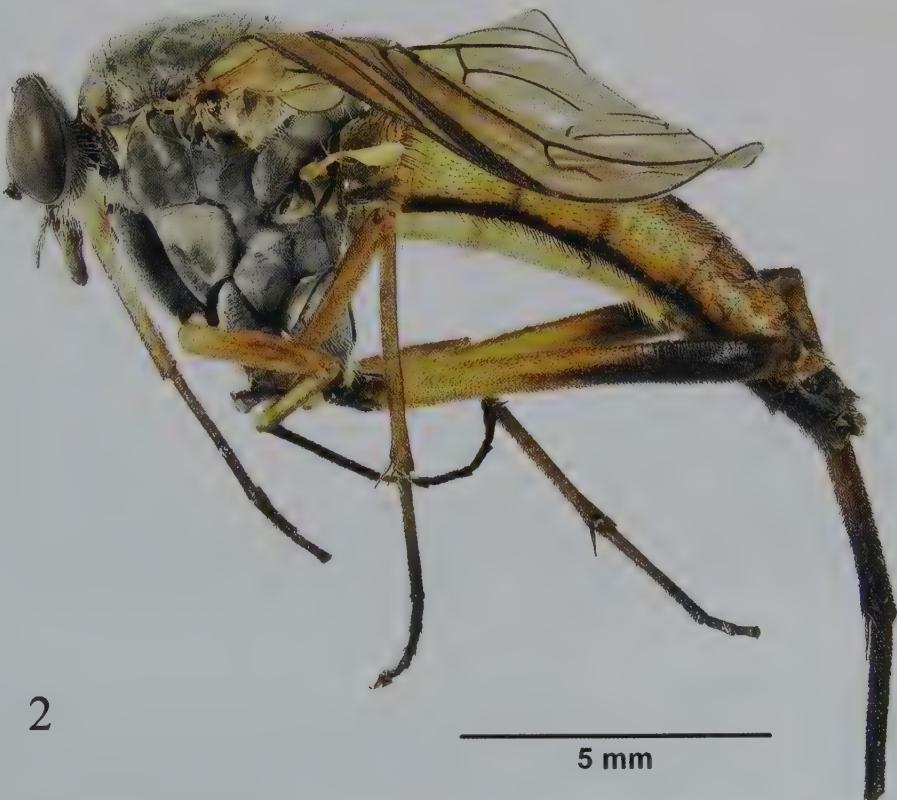
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5 mm

1

5 mm

2

Plates 1–2. *Rhagio conspicuus* (Meigen), male. 1: Dorsal view; 2: Lateral view. (Photographs © James Turner / NMWC)

Order Diptera, family Mydidae

Torsten Dikow

INTRODUCTION

The Mydidae of the United Arab Emirates have been recently reviewed by Deeming (2007) in the first volume of this same book series and a single species, *Rhopalia gyps* Bowden, 1987, had been recorded. Several specimens of then undetermined species had been mentioned in the literature (Howarth, 2006; Deeming, 2007) and new specimens have been collected since that have now been studied and identified by the author. Today, the number of Mydidae species in the UAE can be increased to four species representing three genera. Furthermore, the first Mydidae species from Oman is recorded. These species are dealt with below and diagnosed and illustrated in order to allow correct identification in the future.

Mydidae, with 461 species in 66 genera, is one of the less speciose families of Asiloidea (Diptera: Brachycera). Species are distributed in warmer climates throughout the world and arid as well as Mediterranean-type environments are particularly species-rich. The highest species diversity is found in southern Africa. Although several regional faunas are fairly well known, e.g., North America, Australia, or Chile, there are still many areas where new species will be found and need to be made scientifically known.

MATERIALS AND METHODS

Institutions providing specimens are listed below, together with the abbreviations used in the text when citing depositories, and the people who kindly assisted: BMNH - The Natural History Museum, London, England, UK (E. McAlister); ENHG - Emirates Natural History Group, Al Ain, Abu Dhabi, United Arab Emirates (B. Howarth); NMWC - National Museum Wales, Cardiff, Wales, UK (J. Deeming); UAEIC - United Arab Emirates Invertebrate Collection.

Morphological terminology follows McAlpine (1981) and Dikow (2009).

SYSTEMATIC ACCOUNT

Subfamily *Leptomydinae* Papavero & Wilcox, 1974

Genus *Eremomidas* Semenov, 1896

The genus *Eremomidas* comprises five species primarily known from central Asia (Kazakhstan, Uzbekistan, Turkmenistan, Tajikistan), with a single species in the Afrotropical region (Yemen). This Afrotropical species is here recorded from Oman and the UAE for the first time.

Eremomidas arabicus Bequaert, 1961

Plate 1

Specimens studied: Ad-Dhaid, village Rasheed, 25°17'N 55°53'E, 1♀, 23.ix.2007, leg. J. Batelka & H. Pinda (NMWC); Khor Yfrah, 25°31'N 55°35'E, 1♀, 15.ix.2006, leg. B. Howarth (ENHG). Wadi Bih, 1♀, 24.ix.1979, leg. J. Brown (BMNH). OMAN: Al-Wusta, between Qarn Alam and Haima, 20°45'N 57°05'E, 1♂, 19.ix.1979, leg. R. Whitcombe (BMNH). Ash-Sharqiyah, Wahiba Sands, SE Wasil, 22°26'N 58°45'E, 1♂, 25.x.1990, leg. M. Gallagher & J. Deeming (NMWC).



Plate 1. *Eremomidas arabicus* Bequaert, female, ad-Dhaid. (Photograph by Jan Batelka)

Diagnosis: *E. arabicus* is distinguished from other *Eremomidas* species by the overall white or light grey appearance (Plate 1), the sharply depressed vertex, the absence of long setae on thorax and abdomen, the vestigial proboscis, and M_{1+2} terminating in R_1 . To this day, it is the largest species of Mydidae found in the Arabian Peninsula, with females having a wing length of 17.5–18.2 mm.

Expanded diagnosis based on specimens studied:

Male. Head distinctly wider than thorax (at postpronotal lobes); interocular distance on vertex

smaller than at ventral eye margin; vertex sharply depressed (nearly 90° angle on median eye margin); width of parafacial area (between tentorial pit and median eye margin) less than half the width of facial gibbosity (at same level); densely white pruinose, only ocellar triangle, vertex, and postgenae apruinose and dark brown; facial gibbosity distinct, discernible in lateral view, entirely covered with long, white mystacial setae; frons, vertex, and occiput with white setae; proboscis light brown, vestigial, knob-like; maxillary palpi laterally compressed, light brown, slightly longer than proboscis. Antennae brown; scape and pedicel with white setae dorsally and ventrally, scape longer than pedicel; postpedicel in proximal half cylindrical, distal half symmetrically bulbous, >2.0 times as long as combined length of scape and pedicel; apical 'seta-like' sensory element situated apically in cavity on postpedicel.

Thorax. Light brown, predominantly white pruinose, only postpronotal lobes, proepisternum, anterior half of anepimeron, and posterior half of scutellum apruinose; scutum with faint dark grey longitudinal stripes just lateral of median line and laterally with presutural and postsutural spots. Setation. Distinct notopleural, supra-alar, and postalar macrosetae absent; white setae scattered on scutum, but not on faint dark grey spots/stripes, longest laterally dorsal to anepisternum; antepronotum, proepisternum, and postpronotal lobes with long white setae; katatergite and apruinose part of anepimeron with short white setae; scutellum, mesopostnotum, and anatergite asetose. Legs light brown to brown with white setae; pro and mes coxae apruinose, met coxae white pruinose; femora brown, met femora cylindrical as wide as pro and mes femora, met femora without ventral macrosetae; pro and mes tibiae laterally arched, met tibia straight, met tibia without ventral keel; pro and mes tarsomeres of equal length, met proximal tarsomere as long as combined length of 2nd and 3rd tarsomeres; pulvilli well-developed, as long as well-developed claws, much wider than base of claws. **Wings.** Length 11.2–11.4 mm; hyaline throughout, very few microtrichia scattered on wing, all veins light yellow, all marginal wing cells closed; C terminating at junction with R_1 ; R_4 either terminating in R_{2+3} or R_1 ; R_5 terminating in R_1 ; stump vein (R_3) present at base of R_4 ; R_4 and R_5 (forming cell r_4) more or less parallel medially; M_{1+2} terminating in R_1 ; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); alula very large, touching scutellum medially; haltere light yellow.

Abdomen. Predominantly brown, T2 as wide as T1, T white pruinose, S predominantly apruinose, scattered white setae; T1–7 well-developed and visible; T2 with anterior apruinose stripe; T1–6 posterior margin yellow; bullae on T2 light brown and circular; S1 entirely yellow, S2–7 posterior margin yellow. Terminalia not studied in detail.

Female. Interocular distance on vertex nearly as wide as width of base of scutellum (nearly 3 times as wide as in male) width of parafacial area (between tentorial pit and median eye margin) more than half the width of facial gibbosity; head setation much shorter, only few mystacial setae; thoracic setation much shorter; pulvilli on all tarsi about half the length of claws, only as wide as base of claws; wing length 17.5–18.2 mm; abdominal pruinosity reduced, only T1 completely white pruinose, T2–3 (slightly on T4) only laterally pruinose, T5–8 entirely apruinose; tergites proximally brown in varying extent. **Genitalia.** Ovipositor with acanthophorite plates each with 7 spurs; internal structures not studied.

Remarks: This species was described by Bequaert (1961: 33) from Seivun (= Say'un, Saiwun, 15°56'N 48°47'E) in central Yemen and is here recorded for the first time from Oman and the UAE. The holotype is deposited in the BMNH. This species shows sexual dimorphism particularly in the morphology of the head, the reduction of pulvilli in the female, and reduced setation in the female. Males and females of this species have been photographed at Khor Yfrah, Um al-Quwain, UAE, and the images have been published in Howarth (2006: Figs 1–2).

The placement of this species in *Eremomidas* is somewhat questionable based on comparison

with *Eremomidas bek* Semenov, 1922, from Kazakhstan. In particular, the shape of the aedeagus is different in that it is more or less dorso-ventrally flattened and not laterally compressed as in *Eremomidas* (see illustrations in Richter & Ovtshinnikova, 1996; Richter, 1997), the wing venation is more similar to Syllegomydinae in that M_{1+2} terminates in R_1 and not in C as is found in *Eremomidas* and Leptomydinae, and the proboscis is vestigial as is always found in species of *Syllegomydas* Becker, 1906 (Syllegomydinae). The latter two characters are probably the reason why Deeming (2007) recorded a specimen from Oman (Wahiba Sands, NMWC) as belonging to *Syllegomydas*, which has now been identified as *Eremomidas arabicus*. The correct generic placement of this species and an undescribed one from Sudan, which is very similar in aedeagal and proboscis morphology and wing venation (unpublished data), needs to be established with a phylogenetic analysis of Mydidae genera that is currently in preparation by the author.

Distribution: Yemen, Oman, UAE. This species is therefore distributed in both the Afrotropical and Palaearctic regions.

Subfamily *Rhopaliinae* Papavero & Wilcox, 1974

Genus *Perissocerus* Gerstaecker, 1868

The genus *Perissocerus* comprises seven species distributed primarily in the Palaearctic region (northern Africa: Western Sahara, Algeria, Tunisia, Libya; central Asia: Kazakhstan, Turkmenistan, Uzbekistan) with two species found in the Afrotropical region (Ethiopia, Yemen).

Perissocerus arabicus Bequaert, 1961

Specimens examined: Rhas Ganada, 24°45'N 54°53'E, 1♀, 6.xi.1992, leg. B. Tigar (BMNH).

Diagnosis: *P. arabicus* is a small Mydidae species that is entirely covered with white setae and can therefore be distinguished from other Mydidae in the Arabian Peninsula very easily. The vestigial proboscis and the characteristic shape of the postpedicel in the antennae distinguishes it from species of *Rhopalia*.

Expanded diagnosis based on specimens studied:

Female. Head distinctly wider than thorax (at postpronotal lobes); interocular distance on vertex greater than at ventral eye margin; vertex not depressed; width of parafacial area (between tentorial pit and median eye margin) about half the width of facial gibbosity (at same level); lateral face, lateral frons, and occiput grey pruinose; facial gibbosity, ocellar triangle, most of frons, and vertex apruinose and black; facial gibbosity distinct, well-developed and distinct in lateral view, entirely covered with long, white mystacial setae; facial gibbosity, frons, vertex, and postgenae with long white setae; occiput with short white setae; proboscis light brown, vestigial, knob-like; maxillary palpi vestigial, light brown with long white setae. Antennae brown; antennae elevated above eye margin in lateral view on distinct protuberance; scape and pedicel with yellow setae dorsally and ventrally, scape more than 2 times as long as pedicel; postpedicel in proximal 1/3 cylindrical, distal 2/3 bulbous, expanded ventrally, >3.0 times as long as combined length of scape and pedicel; apical 'seta-like' sensory element situated apically in cavity on postpedicel.

Thorax. Brown to black, predominantly apruinose, only antepronotum, katatergite, anatergite, and mesopostnotum grey pruinose; scutum predominantly black, postpronotal lobes and lateral scutum brown. Setation. Distinct notopleural, supra-alar, and postalar macrosetae absent; long, dense, white setae scattered on scutum, postsutural dorsocentral setae directed anteriorly; postpronotal lobes, proepimeron, lateral proepisternum, and anepimeron with long white setae; scutellum brown with white discal scutellar setae. Legs light brown with white

setae; coxae partly brown, apruinoose; femora brown, met femora only slightly expanded distally, no ventral macrosetae; pro and mes tibiae laterally arched, met tibia straight, met tibia without ventral keel; pro and mes proximal tarsomeres as long as 2nd tarsomere, met proximal tarsomere longer than 2nd tarsomere; pulvilli reduced, vestigial, less than 1/4 of length of well-developed claws, only as wide as base of claws. Wings. Length 8.2 mm; hyaline throughout, very few microtrichia scattered on wing, veins light brown, R_2 , R_4 , R_5 , and M_{1+2} predominantly white, marginal wing cells closed except for cells r_4 and r_5 which are open; C terminating at junction with R_5 ; R_4 terminating in R_1 ; R_5 terminating in C; stump vein (R_3) absent at base of R_4 ; R_4 and R_5 (forming cell r_4) more or less parallel to each other, not particularly constricting cell; M_{1+2} terminating in C; CuA_1 and CuA_2 split proximally to m-cu (cell m_3 narrow proximally); alula well-developed, but not touching scutellum medially; haltere light yellow.

Abdomen. Predominantly brown, T2 as wide as T1, T and S apruinoose, T1 with long white setae throughout, T2–4 with long white setae laterally; T2–7 with posterior margin yellow; bullae on T2 brown and transversely elongate; S brown with white setae. Genitalia. Ovipositor with acanthophorite plates each with 9 spurs; internal structures not studied.

Due to the preservation of the specimen the exact shape of the postpedicel can not be determined.

Remarks: This species was described by Bequaert (1961: 33) from Al Huseini (near Lahy = Lahij, $13^{\circ}03'N$ $44^{\circ}53'E$) in south-western Yemen and is here recorded for the first time from the UAE. The holotype is deposited in the BMNH. An image of a male specimen from Dubailand, Dubai, UAE ($24^{\circ}59'N$ $55^{\circ}19'E$, 2.x.2006, D. Gardner) has been published in Howarth (2006: Fig. 3).

Distribution: Yemen, UAE.

Genus *Rhopalia* Macquart, 1838

The genus *Rhopalia* comprises 13 species distributed in the southern Palaearctic Region (northern Africa: Algeria, Egypt, Morocco, and Tunisia as well as Afghanistan, Iran, Saudi Arabia, Syria, and the United Arab Emirates). Two species are here recorded from the UAE of which one has been collected for the first time only very recently. The three most recent publications on this genus were published by Séguy (1941), Bequaert (1961), and Lyneborg (1970). Although these studies provide help in identification of species, correct determination of all species seems at present not possible. This is partly due to the fact that male and female specimens of the same species might be morphologically (and particularly in colouration) quite different.

Rhopalia gyps Bowden, 1987

Specimen studied: Wadi Midaq, 1♀, 29.iii–1.iv.2006, leg. A. van Harten (NMWC).

Diagnosis: *R. gyps* is a medium-sized Mydidae species of brown colouration. It is most easily distinguished from other Mydidae on the Arabian Peninsula by the well-developed proboscis, the presence of vein CuA_1+M_3 that reaches the posterior wing margin, and the colouration along the wing veins M_{1+2} , M_3 , and CuA_1 . For other features see Bowden (1987) and the image in Deeming (2007).

Remarks: This species was described by Bowden (1987: 153) from the Tuwayq Hills in central Saudi Arabia and was first recorded in the UAE and illustrated by Deeming (2007).

Distribution: Saudi Arabia, UAE.

Rhopalia olivieri Macquart, 1838

Plates 2–3

Specimens studied: S of Ra's al-Khaymah, 1♂, 1♀, 5–6.iv.2008, leg. K. Mahmood (NMWC, UAEIC).

Diagnosis: *R. olivieri* is a relatively small Mydidae species that is black and yellow in colouration (Plates 2–3) and can therefore be distinguished from other Mydidae in the Arabian Peninsula very easily. The well-developed proboscis distinguishes it from species of *Perissocerus* while the absence of colouration along the wing veins, in particular on veins M_{1+2} and CuA_1 , and the absence of $CuA_1 + M_3$ reaching the posterior wing margin distinguish it from *Rhopalia gyps*.

Expanded diagnosis based on specimens studied:

Male. Head distinctly wider than thorax (at postpronotal lobes); interocular distance on vertex greater than at ventral eye margin; vertex only slightly depressed; width of parafacial area (between tentorial pit and median eye margin) less than half the width of facial gibbosity (at same level); lateral face and occiput grey pruinose; facial gibbosity, ocellar triangle, frons, and vertex apruinose and dark brown; facial gibbosity distinct, well-developed and distinct in lateral view, entirely covered with long, white mystacial setae; facial gibbosity, frons, vertex, and postgenae with long white setae; occiput with short white setae; proboscis brown, well-developed, protruding well beyond apex of pedicel; maxillary palpi vestigial, cylindrical, light brown. Antennae brown; antennae elevated above eye margin in lateral view on distinct protuberance; scape and pedicel with yellow setae dorsally and ventrally, scape about 3 times as long as pedicel; postpedicel in proximal half cylindrical, distal half bulbous, expanded ventrally, >7.0 times as long as combined length of scape and pedicel; apical ‘seta-like’ sensory element situated apically in cavity on postpedicel.

Thorax. Dark brown to black, predominantly apruinose, only antepronotum, proepimeron, katatergite, anatergite, and mesopostnotum grey pruinose; scutum predominantly black, postpronotal lobes and lateral scutum yellow. Setation. Distinct notopleural, supra-alar, and postalar macrosetae absent; long white setae scattered on scutum, postsutural dorsocentral setae directed anteriorly; proepimeron, lateral proepisternum, and anepimeron with long white setae; scutellum brown, laterally black, few white discal scutellar setae. Legs yellow with yellow setae; coxae partly brown, apruinose; femora yellow, met femora bulbous apically, evenly expanded, two rows of ventral macrosetae; pro and mes tibiae laterally arched, met tibia straight, met tibia without ventral keel; all proximal tarsomeres as long as 2nd tarsomeres; pulvilli well-developed, about 3/4 of length of well-developed claws, much wider than base of claws. Wings. Length 7.7 mm; posterior half hyaline (most of cell r_5 and posterior to CuA_1), anterior half brown stained; very few microtrichia scattered on wing, veins brown, M_{1+2} apically white, marginal wing cells closed except for cells r_4 and r_5 which are open; C terminating at junction with R_5 ; R_4 terminating in R_1 ; R_5 terminating in C ; stump vein (R_3) absent at base of R_4 ; R_4 and R_5 (forming cell r_4) approaching each other at 2/3 of length, therefore constricting cell r_4 ; M_{1+2} terminating in C ; CuA_1 and CuA_2 split proximally to $m-cu$ (cell m_3 narrow proximally); alula well-developed, but not touching scutellum medially; haltere light yellow.

Abdomen. Predominantly yellow, T2 as wide as T1, T and S apruinose, scattered white to yellow setae, longest on T1; T1–7 well-developed and visible; T2–7 laterally brown; bullae on T2 brown and transversely elongate. Terminalia not studied in detail.

Female. Scutum predominantly brown, setation much shorter; met femora less bulbous and expanded; proximal met tarsomere longer than 2nd tarsomere, pulvilli on all tarsi about half the length of claws, only as wide as base of claws; wing length 8.4 mm; abdomen brown and yellow, T1 brown medially and yellow laterally; T2 proximally yellow, brown distally; T3–8 and S2–8 brown proximally and yellow distally, distal colouration less yellow on posterior T, only T2–5 brown laterally. Genitalia. Ovipositor with acanthophorite plates each with 8 spurs; internal structures not studied.



2

5 mm



3

5 mm

Plates 2–3. *Rhopalia olivieri* Macquart, S of Ra's al-Khaymah. 2: Female; 3: Male. (Photographs © James Turner / NMWC)

Remarks: The holotype of this species is deposited in the Muséum national d'Histoire naturelle (MNHN, Paris, France), but has not been studied. As mentioned above, the species identification is not entirely certain as there is no recent revision of this genus. In the key to species provided by Séguin (1941) it will run to *Rhopalia olivieri*, but *Rhopalia oldroydi* Lyneborg, 1970, which was described from central Afghanistan, does match the species in many details as well. Having studied specimens indistinguishable from the ones above

collected in Israel (manuscript in preparation), which is not too far from the type locality in Egypt, makes me believe that *Rhopalia olivieri* is also present in the Arabian Peninsula. Distribution: Egypt, UAE.

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Order Diptera, family Ulidiidae

Elena P. Kameneva & Valery A. Korneyev

INTRODUCTION

The picture-winged flies (Ulidiidae) occur almost worldwide, with more than half of the species and 75% of the genera in the Neotropical Region. The fauna of the Afrotropical Region is very poor, when compared with the Palaearctic, Nearctic and Neotropical Regions; it includes only 19 species (Steyskal, 1980; Barraclough, 2000).

The material from Arabian Peninsula contains almost exclusively species of the genus *Physiphora* Fallén. One species has previously been recorded by from Yemen by Hendel (1913).

MATERIALS AND METHODS

In the course of intensive field work 565 specimens of Ulidiidae were collected, almost all with Malaise and light traps, all by A. van Harten. The holotype of the new species is deposited in the Schmalhausen Institute of Zoology, Kiev, Ukraine (SIZK). Other specimens are mostly divided between the United Arab Emirates Invertebrate Collection (UAEIC), the National Museums and Galleries of Wales, Cardiff, Wales, UK (NMWC), and the Schmalhausen Institute of Zoology. The following abbreviations are used: NARC = National Avian Research Centre; LT = light trap; MT = Malaise trap.

SYSTEMATIC ACCOUNT

Terminology of morphological structures and abbreviations is adopted from McAlpine (1981). The specimens examined are listed according to localities in alphabetical order, and to collecting dates in cases where a species was collected more than once at the same locality. All the listed taxa are recorded from the UAE for the first time.

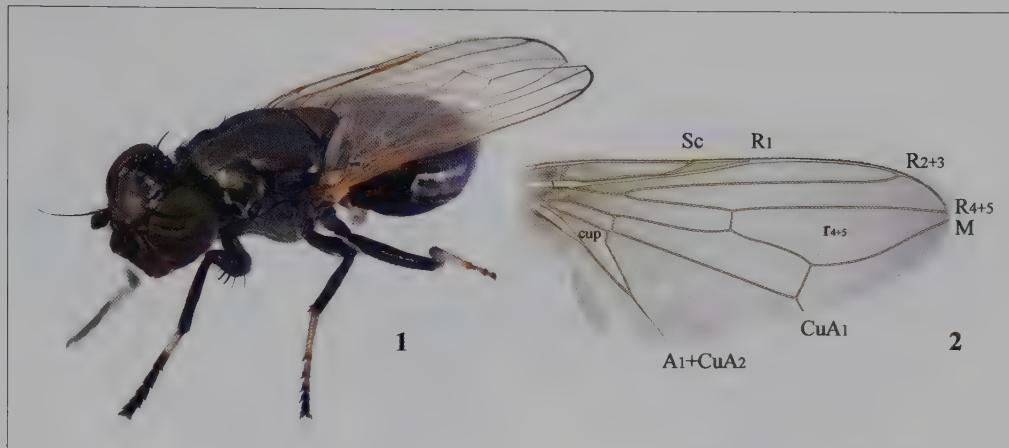
Subfamily **Ulidiinae** Macquart, 1835

Tribe **Ulidiini** Macquart, 1835

Genus **Physiphora** Fallén, 1810

Physiphora Fallén, 1810: 11. Type species: *Chrysomyza splendida* Fallén, 1817 (= *Musca alceae* Preyssler, 1791), by subsequent monotypy in Fallén, 1817: 3.

Description: Body mostly black, often with strong green to red metallic sheen. Head at most a little longer than high. Frons smooth or rarely pitted; frontal vitta often without setulae, in posterior part sometimes with four low longitudinal swellings, usually with one or two spots of whitish microtrichia. Vertical plates with 2–4 short setae; ocellar triangle with pair of short ocellar setae. Face saddle-like, slightly concave in profile, usually white microtrichose in dorsal portion (at least between antennae), with shallow, usually gray microtrichose antennal grooves. Parafacial and facial bare or with longitudinal stripes of white microtrichia; gena bare, rarely with patches of microtrichia. Pedicel short. Scape with rather deep triangular incision. First flagellomere short oval, not over three times as long as wide, rounded at apex. Palpus flattened oval, not widened apically, usually as long and as wide as flagellomere 1, white microtrichose, with 12–15 lateral and ventral setae almost as long as palpus is wide.

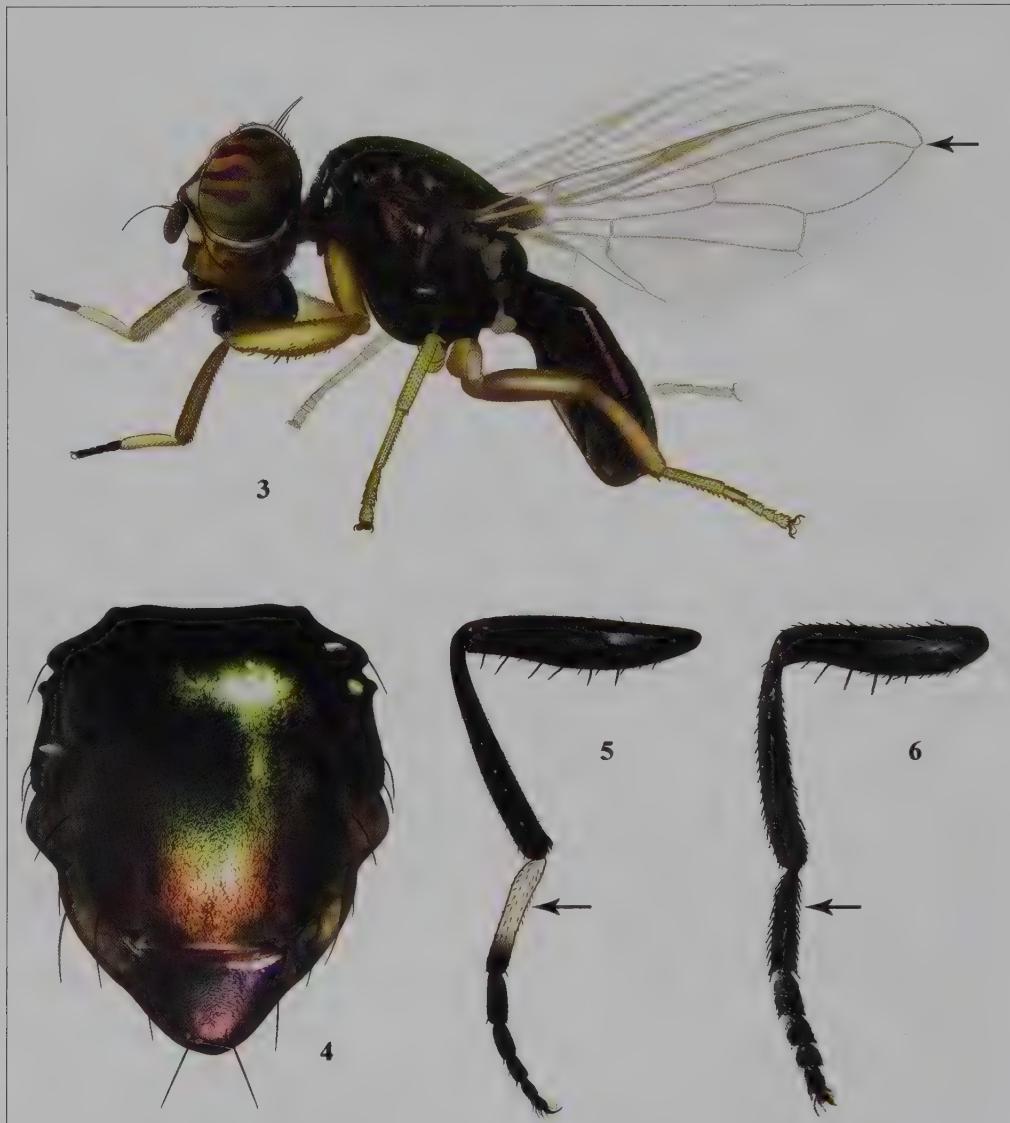


Plates 1–2. 1: *Physiphora alceae* (Preyssler), ♂, total view; 2: *P. sericea* (Hendel), wing. Abbreviations: veins — Sc, R₁, R₂₊₃, R₄₊₅, M, CuA₁, A₁+CuA₂; cells — r₄₊₅, cup.

Thorax entirely black, mostly with metallic greenish, copper, golden, blue or purple sheen. Postpronotal lobe with 1 seta and 3–5 setulae; proepisternum with one long and 7–8 shorter setae. Prosternum transverse, trapezoidal, without conspicuous setae. Mesonotum with scutum and postero-dorsal part of anepisternum densely shagreened. Anterior part of mesonotal scutum and postero-dorsal part of anepisternum setose; rest of scutum usually bare, sometimes with dorsocentral and acrostichal row of very fine and short setulae. 2 notopleural, 2 postsutural supraalar, 1 intraalar and 1 postalar seta present. Dorsocentral and acrostichal setae very fine, inconspicuous or absent. One strong seta and 5–6 shorter setulae on posterior margin of anepisternum; katepisternum with one strong posterodorsal seta. Scutellum triangular, flattened, shagreened, with 2 pairs of scutellar setae and fine setulae on disc and margins; posteroventral margin bare or microtrichose. Subscutellum matt, short microtrichose. Mediotergite slightly shagreened, subshining green.

Wing entirely hyaline with yellow veins (rarely partly brown), vein R₁ bare, cell r₄₊₅ apically narrowed or closed, sometimes with short petiole; cell cup with long extension at posteroapical corner, usually as long as the remaining vein A₁+CuA₂.

Male abdomen with 5 preabdominal segments. Male postabdomen: membranous pouch between tergite 5 and postabdomen, dorsolateral, densely microtrichose; sternite 8 setulose; epandrium large, short surstyli separated by seam; proctiger low, not protruding posteriorly, usually with pair of short submedial nipple-like ventral projections bearing single apical short setula (absent in *P. leucotricha* nov. spec.); subepandrial sclerite flat, V- or U-shaped, without thickened tooth-like setulae (prensisetae); hypandrium U-shaped, asymmetrical: right gonite ovoid, with sclerotized lateral sclerite, left gonite almost inconspicuous; both gonites without setulae; apodeme of hypandrium Y-shaped, vanes of fultella inconspicuous; sensillar plates at sides of phallus base rounded, simple; phallus large, thick and mostly bare, with single membranous sack-like projection subapically and apical area (glans) bearing several semi-free hook-like sclerotized appendages; epiphallus not expressed; ejaculatory apodeme wide fan-like, with short apical portion and relatively small sperm pump.



Plates 3–6. 3–4: *Physiphora clausa* (Macquart). 3: ♂, total view, left lateral, arrow shows petal at r_{4+5} cell apex; 4: Mesonotum, dorsal view); 5: *P. alcea* (Preyssler), foreleg (arrow shows metetarsus); 6: *P. sericea* (Hendel), same.

Female similar to male; abdomen with 6 visible segments; tergite 2 in all examined species (*P. alcea* (Preyssler, 1992), *P. clausa* (Macquart, 1843), *P. longicornis* (Hendel, 1909), *P. sericea* (Hendel, 1913), *P. smaragdina* (Loew, 1852) and *P. violacea* (Hendel, 1910)) with pair of dimple-like structures: round matt spots lacking metallic sheen and having hexagonal cellular structure at sides (Plates 46–47: ds); sternites 3–6 without anteromedial apodemes; tergite and sternite 6 subequal, conspicuously narrower and shorter than tergite 5;



Plates 7–11. *Physiphora* heads, anterior. 7: *P. alcea* (Preyssler); 8: *P. clausa* (Macquart); 9: *P. leucotricha* nov. spec.; 10: *P. sericea* (Hendel); 11: *P. smaragdina* (Loew).

postabdomen: Oviscape short, at most as long as tergite 5 and 0.25–0.3 times as long as aculeus; eversible membrane (Plate 25) as long as aculeus, with 2 pairs of bare taeniae almost reaching its posterior margin; membrane finely microtrichose in anterior 0.8 and covered with fine multidentate scales in posterior 0.2 of its length. Aculeus (Plates 26, 48) narrow and long, 6.5–12 times as long as wide, with elongate oval cercal unit (Plates 27, 49) bearing 2 pairs of long setae (basal dorsal and subapical latero-ventral) and several shorter setulae on ventral and latero-ventral side; anal opening (slit) on dorsal side of cerci; sternite 8 well-sclerotized, with 11–12 setulae on each side; medial groove covered with monodentate scales; vagina (= genital chamber) with simple, finger-like ventral receptacle (Plates 29, 30); 3 spherical (or collapsed to mushroom-like shape) spermathecae, single right and 2 left on Y-shape bifurcated common duct (Plates 28, 50).

Remarks: The genus was revised by Hendel (1909; 1913); later, Séguy (1941) described and keyed several Afrotropical species. Recently, Chen & Kameneva (2007) revised Chinese species. However, Afrotropical fauna needs further thorough revision.

In the present study, we found that there are at least five *Physiphora* species occurring in the UAE. One of them is a previously unknown species described below. Here, we provide species diagnoses, descriptions, illustrations and a key to the included species. In addition to *Physiphora* species, one species of *Melieria* Robineau-Desvoidy, 1830, is recorded from the UAE.

Recognition: *Physiphora* differs from *Ulidia* Meigen, 1826, and *Timia* Wiedemann, 1824, by having the face saddle-like (without sharply raised medial carina or deeply emarginated antennal grooves), eyes of live specimens with purple and bright green pattern of the compound eye (not known in *P. aperta* Steyskal, 1952, and *P. leucotricha* nov. spec.), metallic shiny thorax, hyaline wing without a pattern and with the medial vein strongly curved anteriorly and the female abdominal tergite 2 with pair of dimple-like structures (not examined in *P. aperta* Steyskal and *P. leucotricha* nov. spec.).

The sexual behaviour of *Physiphora* also differs from that in *Timia* and partly from *Ulidia*: Flies of the latter genera usually demonstrate spotted wings and white and yellow pattern of their bodies, whereas *Physiphora* demonstrate mainly patterned eyes or foretarsi (Alcock & Pyle, 1979).

Phylogenetic relationships of *Physiphora*: Monophyly of *Physiphora* is supported by having patterned eyes (?synapomorphy); metallic shiny thorax (synapomorphy), hyaline wing without a pattern (synapomorphy) and female abdominal tergite 2 with pair of dimple-like structures (?synapomorphy) in combination with the face being saddle-like without sharply raised medial carina (symplesiomorphy).

Most species of *Physiphora* possess male proctiger with pair of nipple-like structures bearing short trichoid sensillum on its tip (Plate 33: ns), which does not occur in other ulidiids and is a synapomorphy of them, as well as the absence of extensive microtrichose area and long setulae on frons, mesonotum and anepisternum. On the contrary, *P. leucotricha* nov. spec. has the proctiger without such nipple-like structures (Plates 37, 38), frons with extensive white microtrichose area (Plate 9) and mesonotum and anepisternum with numerous and long whitish setulae (Plates 13, 15), which represent plesiomorphic states of these characters often occurring in the outgroups (*Ulidia* and *Timia*), therefore forming a sister lineage to the rest of *Physiphora*. In this species, fore basitarsomere is partly yellow (Plate 12).

Four species, *P. obscura* (Hendel), *P. sericea* (Hendel), *P. smaragdina* (Loew) from the Afrotropical Region and *P. chalybea* Hendel, 1909, from Central Asia have fore basitarsomere entirely black, which is believed to be their synapomorphy (compared to *P. leucotricha* nov. spec. as an outgroup). At least two of them, *P. sericea* and *P. smaragdina*



Plates 12–15. *Physiphora leucotricha* nov. spec., holotype ♂. 12: Total view, dorsally; 13: Same, right laterally; 14: Head, same; 15: Mesonotum.

also possess highly modified structure of the phallus glans: the basalmost sclerotized projections are opposite and saber-like.

The remaining species of *Physiphora* share yellow fore basitarsomere (symplesiomorphy). Three of them, *P. flavipes* (Karsch, 1888), *P. clausa* (Macquart) and *P. africana* Hendel, 1909, have the wing cell r_{4+5} closed, and the two latter species with the petiole joining it with costal vein; these species are believed to form another monophyletic cluster. Other species of the genus with the yellow fore basitarsomere, including *P. alceae*, form a paraphyletic group. Most of them require additional taxonomic study.

Distribution: *Physiphora alceae* and *P. clausa* are widespread in all the zoogeographical regions. There are 12 species of *Physiphora* occurring in the Afrotropical Region. Only *P. chalybea* Hendel was described from Central Asia, and 3 species occur in North Africa as well as tropical Africa. *Physiphora aperta* Steyskal, 1952, is endemic to Solomon Islands. Five species were listed from the Oriental Region, one of them (*P. longicornis* Hendel) occurs in Taiwan and Ceylon, *P. euphorbiae* N. Krivosheina & M. Krivosheina, 1997, found in India, and *P. hainanensis* X.-L. Chen, 2007, was described from Southern China (Chen & Kameneva, 2007).

Key to the species of *Physiphora* occurring in the UAE

- 1 Fore basitarsomere yellow with white microtrichia and setulae (Plate 5) 2
- Fore basitarsomere entirely black (Plate 6) 4
- 2 Forefemur yellow or at most with black basal patch. Cell r_{4+5} completely closed, with apical petiole connected to costal vein (Plate 3) *P. clausa* Macquart
- Forefemur black. Cell r_{4+5} almost closed, but without apical petiole (Plates 2, 12) 3
- 3 Frons shining orange to dark brown in the middle, except for 2 (often connected) narrow white microtrichose patches at each side. Mesonotum almost bare, at most with pair of postsutural rows of fine brown dorsocentral setulae in shallow pits (Plate 1). Facial carina and antennal grooves with entire area of greyish microtrichia (Plate 7). Gena reddish, without white microtrichia *P. alceae* Preyssler
- Frons microtrichose in the middle, with pair of subshining reddish brown spots in anterior half and matt brown spot in posterior half, anteriad to ocellar triangle. Mesonotum and anepisternum with numerous, but rather sparse white setulae (Plates 13, 15). Facial carina with narrow inverted Y-shaped pattern of white microtrichia separated from antennal grooves by pair of shining black vittae (Plate 9). Gena brown with C-shaped white microtrichose area at postgena border (Plate 14) *P. leucotricha* nov. spec.
- 4 Frons dull black, rarely opalescent or with satin bluish sheen, without swellings in the middle; anterolateral corners and vertical plates with metallic dark blue or greenish sheen (Plate 11) *P. sericea* Hendel
- Frons uniformly shining, brown to brownish black; vertical plates black with greenish metallic sheen; four longitudinal oval swellings at frons middle (Plate 10) *P. smaragdina* Loew

Physiphora alceae (Preyssler, 1792)

Plates 1, 5, 7, 16, 22–30

Specimens examined: Al-Ajban, 8♂, 5♀, 6–25.vii.2006, MT; 2♂, 13♀, 26.ii–2.iv.2006, MT; 4♂, 26.ii–27.iii.2006, LT; 1♂, 1♀; 6–22.v.2006, LT. Bithnah, 15♂, 7♀; 31.xii.2005–2.ii.2006, LT. Fujairah, 1♂, 1♀; 2–30.i.2006, LT; 32♂, 33♀, 28.ii–21.iii.2006, LT; 3♂, 6♀, 28.ii–1.iv.2006, LT; 13♂, 13♀, 20–27.v.2006, LT. Hatta, 43♂, 12♀, 19–28.iii.2006, LT; 30♂, 11♀, 8–26.iv.2006, LT; 28♂, 18♀, 24–



16



17



18



19



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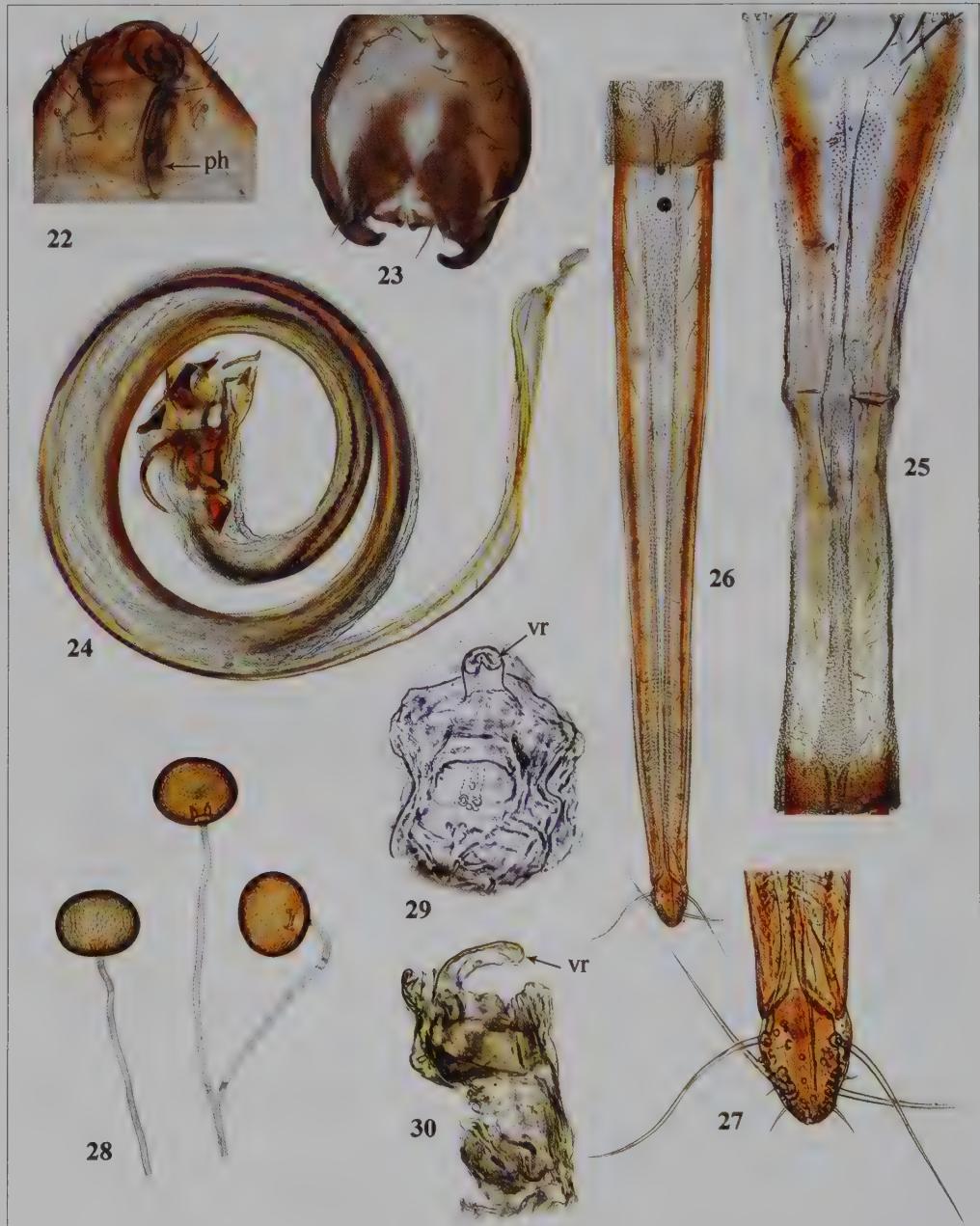


21

Plates 16–21. *Physiphora* glans of phallus. 16: *P. alcea* (Preyssler); 17: *P. clausa* (Macquart); 18–19: *P. leucotricha* nov. spec. (different aspects); 20: *P. sericea* (Hendel); 21: *P. smaragdina* (Loew).

30.v.2006, LT. Near Mahafiz, 1♂, 2♀, 10–29.xii.2005, LT; 2♂, 3♀, 29.xii.2005–7.i.2006, LT. Sharjah-Khor Kalba, near tunnel, 6♂, 3♀, 16–31.i.2006, LT; 6♂, 10♀, 7–22.iii.2006, LT. NARC, near Sweihan, 24♂, 5♀, 16.xi–21.xii.2005, LT. Wadi Maidaq, 11♂, 2♀, 27.iv–4.v.2006, LT. Wadi Safad, 13♂, 4♀, 27.xi–22.xii.2005, LT.

Description: Head (Plate 7). Frons yellow-brown, rarely to dark brown, satin shining, very sparsely and finely, almost inconspicuously setulose, with one pair of tomentose areas adjacent to eye margins, with two pairs of oval swellings in posterior to its middle and slightly concave anterior half, 1.2 times as long as wide. Vertical plates usually black, with greenish or dark blue sheen, bearing 2 pairs of black, short, slightly reclinate orbital setae. Face reddish yellow to reddish brown, dorsal half of median carina and antennal grooves gray microtrichose. Lunule shining orange to brown. Facial ridge, parafacial and gena shining orange or brown, gena 1/3 times as high as eye; only parafacial with narrow white



Plates 22–30. *Physiphora alcea* (Preyssler) ♂ (22–24) and ♀ (25–30), genitalia: 22: Abdomen apex and hypopygium, ventral view; 23: Epandrium, posterior view; 24: Phallus; 25: Eversible membrane of ovipositor; 26: Aculeus, ventral view; 27: Same, apex, ventral view; 28: Spermathecae; 29–30: Genital chamber (=vagina), different aspects. Abbreviations: ph — phallus; vr — ventral receptacle.

microtrichose stripe along anteroventral eye margin. Occiput black, with yellowish brown area behind ocellar triangle and postgena; orbit between posterodorsal eye margin and row of black postocular setae with very narrow white microtrichose stripe or without it. Medial vertical seta half as long as frons is wide, 1.5 times as long as lateral vertical and 3–5 times as long as ocellar, orbital and postocellar setae. Antenna reddish brown, greyish microtrichose; flagellomere 1 rounded apically, 1.5 times as long as wide; arista bare, yellow in basal 1/4, remainder black. Clypeus orange to brown. Palpus brown to black, microtrichose, with moderately long black setulae. Mouthparts black.

Thorax (Plate 1). Scutum and scutellum brown to black, with dull green metallic sheen, shagreened, except antepronotum, posterior surface of postpronotal lobe and notopleuron, as well as pleura strongly shining, except posterodorsal part of anepisternum shagreened; supraalar area and tympanal fossa matt black, postscutellum black, gray microtrichose; postero-ventral margin of scutellum without microtrichose area. Mesonotal scutum with short medial row of setulae in anterior portion, pair of regular dorsocentral and intraalar rows, all setae very fine and short, black; pair hair-like acrostichal and dorsocentral seta. One postpronotal, 2 postsutural supra-alar, one intraalar and one postalar setae strong, black. Scutellum with very fine and short black setulae and 2 pairs of black scutellar setae.

Wing. Entirely hyaline, with pale yellow veins; cell r_{4+5} almost closed, not forming petiole; postero-apical extension of cell cup 1.5 times as long as vein $A_1 + CuA_2$, and 4 times as long as transverse section of vein CuA_2 . Costal vein from middle of costal cell to middle of r_1 cell with alternate thickened and thin setae in antero-dorsal and antero-ventral rows.

Legs. Black except foretarsus with basitarsomere creamy yellow in basal 3/4, mid- and hindtarsi yellow; all setae black; forefemur postero-ventrally with 5–7 thickened, but rather short setae in apical half.

Abdomen. Both tergites and sternites brown or black-brown, with very weak bluish or greenish reflection, with black setulae; female abdominal tergite 2 with pair of matt gray spots (= dimple-like structures) laterally; tergite 5 in both male and female conspicuously shagreened, subshining black. Male postabdomen brown to black; epandrium as on Plate 23, phallus glans as on Plates 16 and 24. Female terminalia: aculeus (Plate 26) 6.5–8 times as long as wide at base; 3 spherical spermathecae (Plate 28).

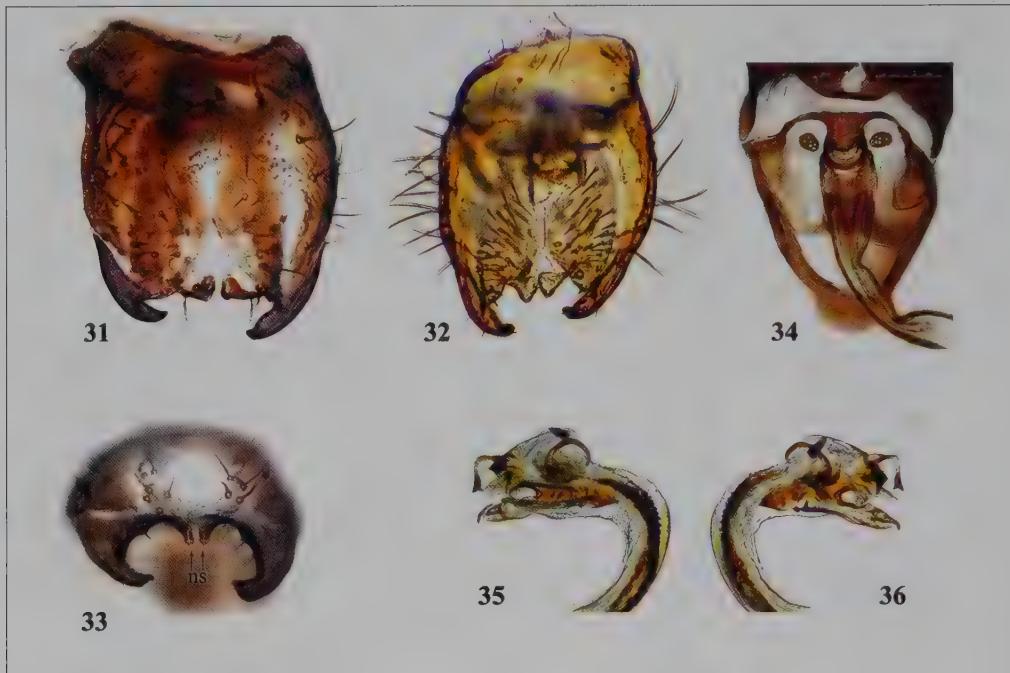
Distribution: Subcosmopolitan, except subpolar regions.

Physiphora clausa (Macquart, 1843)

Plates 3, 4, 8, 17, 31–36

Specimens examined. Fujairah, 32♂, 33♀; 28.ii–21.iii.2006, LT; 3♂, 28.ii–1.iv.2006, LT; 6♂, 1♀; 2–30.i.2006, LT. Hatta, 39♂, 35♀, 19–28.03.2006, LT. Wadi Maidaq, 1♂, 27.ivv4.v.2006, LT.

Description: Head (Plate 8). Frons yellow-brown to red-brown, satin shining, without conspicuous setae, with one pair of tomentose areas adjacent to eye margins, with two pairs of oval swellings in posterior to its middle and slightly concave anterior half, 1.2 times as long as wide. Vertical plates usually black, with greenish sheen, bearing 2 pairs of black, short, slightly reclinate orbital setae. Face reddish yellow to reddish brown, often with dark brown or black medioventral portion, dorsal half of median carina and antennal grooves gray microtrichose. Lunule shining brown. Facial ridge, parafacial and gena shining brownish yellow or brown, gena 1/3 times as high as eye; only parafacial with narrow white microtrichose stripe along anteroventral eye margin. Occiput black, with yellowish brown area behind ocellar triangle and postgena; orbit between posterodorsal eye margin and row of black postocular setae with narrow white microtrichose stripe. Medial vertical seta half as long as frons wide, twice as long as lateral vertical and 4–5 times as long as ocellar, orbital and postocellar setae. Antenna reddish brown, sparsely greyish microtrichose; flagellomere 1



Plates 31–36. *Physiphora clausa* (Macquart), ♂ genitalia: 31–33: Epandrium. 31: Posterior view; 32: Anterior view; 33: Ventral view; 34: Hypandrium; 35–36: Glans of phallus, different aspects. Abbreviations: ns — nipple-like structure.

rounded apically, 1.5 times as long as wide; arista bare, yellow in basal $\frac{1}{4}$, black in the rest. Clypeus brown to black, often with greenish sheen. Palpus brown to black, microtrichose, with moderately long black setulae. Mouthparts black.

Thorax. Scutum and scutellum (Plate 4) brown to black, with green, usually transiting into yellowish, red or purple metallic sheen, finely shagreened, except antepronotum, posterior surface of postpronotal lobe and notopleuron, as well as pleura strongly shining, except posterodorsal part of anepisternum shagreened; supraalar area and tympanal fossa distinctly matt grey, with sparse, curled microtrichia, as well as postscutellum; postero-ventral margin of scutellum white microtrichose. Mesonotal scutum with one (or two very close) medial row of setulae becoming disperse at posterior end, pair of regular dorsocentral and intraalar rows (latter having shape of digit '3'), all setae very fine and short, yellow or brown; pair of very tiny, hair-like dorsocentral seta twice as long as setulae anterior of it, and pair of acrostichal setae hardly distinguishable from setulae. One postpronotal, 2 postsutural supra-alar, one intraalar and one postalar setae black. Scutellum with fine and sparse yellow setulae scattered over its disc and 2 pairs of black scutellar setae.

Wing (Plate 3). Entirely hyaline, with pale yellow veins; cell r_{4+5} closed, forming petiole at wing tip; postero-apical extension of cell cup 1.5 times as long as vein CuA_2+A_1 , and twice as long as transverse section of vein CuA_2 . Costal vein from middle of costal cell to middle of r_1 cell with alternate thickened and thin setae in antero-dorsal and antero-ventral rows.

Legs. Yellow except forefemur often with black or dark brown spot, foretibia sometimes brown to black and foretarsus black with basitarsomere entirely yellow; forecoxa white

setulose anteriorly; fore coxa with black or yellow setulae; postero-ventrally with 5-7 thickened, but rather short setae in apical half.

Abdomen. Both tergites and sternites brown or black-brown, with green, red-golden, purple or blue reflection; abdominal tergite 2 yellowish white setulose on sides, in female, with pair of matt gray spots laterally. Male postabdomen yellow, otherwise similar to that of *P. alceae*; phallus glans as in Figures 35-36, with sclerotized projections short. Female terminalia: aculeus 6.5-8 times as long as wide at base; 3 spherical spermathecae.

Distribution: Afrotropical (incl. Seychelles and Mauritius) and Oriental Regions, Australia, North and South Americas, Oceania (Hawaii, Fiji).

***Physiphora leucotricha* Kameneva & Korneyev nov. spec.** Plates 9, 12-15, 18-19, 37-41

Specimens examined: Holotype: ♂, United Arab Emirates, Wadi Safad, 25°13'N 56°19'E, 31.i.-21.ii.2006, in light trap, leg. A. van Harten (SIZK).

Description: Head (Plates 9, 14) black. Frons reddish-brown in medial part, black at posterior and postero-lateral margins, microtrichose in the middle, with pair of matt brown, bare spots in anterior half and matt brown spot in posterior half, anteriad to ocellar triangle; fine and short white setulae forming two oblique irregular rows between vertical plates and middle of anterior margin; 1.3 times as long as wide, 1.2 times as wide as eye, parallel-sided. Ocellar triangle and vertical plates black, with dark blue or greenish sheen in posterior half; vertical plates shagreened at middle and white microtrichose in anterior part, bearing 3-4 short black lateroclinate setae; ocellar triangle with pair of short black ocellar setae. Occiput with black medial and lateral vertical setae. Face black with greenish sheen, except lunule brown, facial carina with inverted Y-shaped white microtrichose mark, separated from entirely gray microtrichose antennal grooves by shining black vitta, but joining to them ventro-laterally by tips of ventral branches. Facialium brown, with narrow microtrichose stripe from antennal groove to ventral end of ptilinal suture; supravibrissal setulae fine, white. Parafacialium with narrow white microtrichose orbit from bare spot at antennal corner to occiput. Gena brown, 1/3 as high as eye, with C-shaped white microtrichose mark along genal dilation of occiput. Occiput black. Antenna red-brown, scape very short, with blackish setulae; pedicel white microtrichose, with black setulae along rather deep incision; flagellomere 1 rounded apically, 1.5 times as long as wide, white microtrichose; arista bare, yellow in basal 1/4, black in the rest. Palpus blackish brown, microtrichose, with moderately long black setulae. Mouthparts black; labellum long yellow setulose.

Thorax (Plates 13, 15) mostly shining black with green or dark blue sheen, mesonotal scutum subshining, with fine cellular sculpture, except anterior part, transverse suture, posterior portion of notopleural triangle and postalar area shining black with faint green tinge; scutellum and posterior portion of anepisternum with tiny cellular sculpture similar to that of mesonotal scutum. Scutellum gray microtrichose on postero-ventral margin. Dorsocentral and acrostichal setae absent, 2 pairs each of supra-alar and scutellar setae; all setae black. Mesonotal scutum, scutellum and anepisternum with sparse, moderately long (1/4-1/3 × as long as setae) white setulae.

Wing (Plate 12). Entirely hyaline, postero-apical extension of cell cup long, twice as long as transverse section of vein CuA₂, cell r₄₊₅ almost closed, but not petiolate (Plate 13). Wing length 3.3 mm.

Legs. Coxae, trochanters and femora dark brown to black, except knees yellow; fore tarsus brown, mid- and hindtibiae yellow; foretarsus black except basal tarsomere almost entirely pale yellow to creamy white, mid- and hindtarsi yellow, except 2 apical tarsomeres brownish. Abdomen black, with green sheen; abdominal tergite 2 black setulose on sides, with 1-2 rows



Plates 37–41. *Physiphora leucotricha* nov. spec., holotype ♂, genitalia. 37–38: Epandrium. 37: Posterior view; 38: Anterior view; 39: Apex of surstylus, ventral view; 40: Hypandrium; 41: Phallus.

of whitish yellow setulae on antero-dorsal part except middle, tergites 3 and 4 with rather dense yellowish setulae at sides (on ventro-lateral and dorso-lateral surfaces), very sparsely setulose at middle; tergite 5 sparsely yellow to white setulose, with 15 brown marginal setae; sternites 2–5 shortly yellowish setulose, with 1–2 pairs of short lateromarginal setae. Male postabdomen: sternite 8 short setulose; hypandrium as in other species of the tribe Ulidiini; epandrium setose dorsally, lateral (=outer) surstylus separated from it by a seam, short, claw-like in posterior aspect (Plate 37), with ventral (apical) lobe spatulate, slightly serrate, bearing 4–5 setulae on edge (Plate 39); medial surstyli (=bacilliform, subepandrial sclerite) tape-like, very narrowly joined at anterior margin to each other, each with 12–13 short setulae, including 2–3 longer setulae at level of lateral surstyli, but without thickened prensisetae (Plate 38); proctiger setulose, poorly sclerotized, without nipple-like structures antero-ventrally; hypandrium (Plate 40) and phallus (Plate 41) as in other Ulidiini, glans with short triangular sclerotized projections (Plates 18–19). Female unknown.

Remarks: The new species is somewhat similar to *P. alcea*e in having brownish frons, black femora, whitish fore basitarsomere, gray microtrichose postero-ventral margin of scutellum and non-petiolate cell r_{4+5} , differing from all known species of the genus by having white microtrichose frons and white setulae on mesonotal scutum, scutellum, anepisternum and abdominal tergite 5, as well as by male cerci without nipple-like antero-ventral structures.

Distribution: Only known from the holotype from the UAE.

Etymology: Species epithet is from the Greek ‘λευκός’, white, light, pure, and ‘θριξ, gen. τριχας’, hair, that means ‘white setose’ or ‘white trichose’, reflecting the presence of white setulae on the body.



Plates 42–50. *Physiphora sericea* (Hendel), ♂ (42–45), ♀ (46–50), genitalia. 42–43: Epandrium. 42: Posterior view; 43: Antero-ventral view; 44: Phallus; 45: Ejaculator apodeme; 46: Abdomen (ovipositor partly detached); 47: Dimple-like structure, enlarged; 48: Aculeus, ventral view; 49: Same, apex, ventral view; 50: Spermathecae. Abbreviations: ds — dimple-like structure.

***Physiphora sericea* (Hendel, 1913)**

Plates 2, 6, 10, 20, 42–50

Specimens examined: Al-Ajban, 1♀; 26.ii–27.iii.2006, LT. Fujairah, 4♀, 20–27.v.2006, LT; 1♀; 2–30.i.2006, LT. Hatta, 1♀; 19–28.iii.2006, LT. NARC, near Sweihan, 2♂, 26.ii–2.iv.2006, LT.

Description: Head (Plate 10). Frons matt black, with faint satin bluish tinge, except antero-lateral corners shining brown, without conspicuous setae, with one pair of tomentose areas adjacent to eye margins, without swellings, 1.1–1.2 times as long as wide. Vertical plates as in *P. alceae*. Lunule shining brown. Face dark brown to black, facial carina with inverted Y-shaped pattern of white microtrichia separated from antennal grooves by shining sides of carina and fused to ventrally microtrichose bottom of antennal groove; ventral half of face shining black with bronze sheen. Parafacial with narrow white microtrichose stripe along anteroventral eye margin. Gena brown, shining, without microtrichose areas except at orbit. Occiput entirely black. Setae as in *P. alceae*. Antenna reddish brown, sparsely greyish microtrichose; flagellomere 1 rounded apically, 1.5 times as long as wide; arista bare, yellow in basal 1/4, black in the rest. Clypeus orange to brown, often with greenish sheen. Palpus brown to black, microtrichose, with moderately long black setulae. Mouthparts black.

Thorax. Scutum and scutellum black, with yellowish green to greenish dark blue metallic sheen, pitted or wrinkled, except antepronotum, posterior surface of postpronotal lobe and notopleuron, as well as pleura strongly shining, except oblique area on notopleuron from antero-dorsal margin to base of posterior notopleural seta and posterodorsal part of anepisternum shagreened or pitted; supraalar area and tympanal fossa matt brown to black, with sparse grayish microtrichia; postscutellum matt black. Mesonotal scutum with pair of rather diffuse and inconspicuous dorsocentral and intraalar rows, and some loose, very fine and short, whitish setulae, mainly in postsutural area; pair of tiny, hair-like dorsocentral setae. Setae as in *P. alceae*. Scutellum with very fine and short brown setulae and 2 pairs of black scutellar setae; its postero-ventral margin without microtrichose area.

Wing. As in *P. alceae*; postero-apical extension of cell cup 2 times as long as vein CuA₂+A₁, and 4 times as long as transverse section of vein CuA₂.

Legs. Black, including whole foretarsus; mid- and hindtarsi yellow; all setae black; forefemur postero-ventrally with 5–7 thickened, but rather short setae in apical half; basal tarsomere of foretarsus entirely black, on ventral surface with brush of brown setulae.

Abdomen. As in *P. alceae*. Male postabdomen: Brown to black, lateral surstyli elongated dorso-ventrally, mesally curved at apex; proctiger with nipple-like structures (Plates 42–43); phallus as on Plate 44, glans with basalmost sclerotized projection long, saber-like and opposed in direction to phallus itself, and with 3 long subapical sclerotized structures as on Plate 20; apodeme of ejaculator as on Plate 45. Female preabdomen: Tergite 2 with pair of dimple-like structures (Plates 46–47). Female terminalia: Aculeus (Plates 48–49) 6.5–8 times as long as wide at base; 3 spermathecae with papillose surface: spherical, often collapsed and appearing mushroom-like (Plates 50).

Distribution: Ethiopia (Steykal, 1980).

***Physiphora smaragdina* (Loew, 1852)**

Plates 11, 21, 51–52

Specimens examined: Hatta, 1♂; 19–28.iii.2006, LT. Near Mahafiz, 2♂, 10–29.xii.2005, LT.

Description: Head (Plate 11). Frons red-brown to brownish-black, satin shining, without conspicuous setae, with one pair of tomentose areas adjacent to eye margins, with two pairs of faint oval swellings in posterior to its middle; 1.3–1.5 times as long as wide. Vertical plates black, with bluish sheen, bearing 2 pairs of black, short, slightly reclinate orbital setae. Face dark brown, lunule shining, facial carina with inverted Y-shaped pattern of white microtrichia separated from antennal grooves by shining sides of carina and fused to it ventrally; ventral



Plates 51–52. *Physiphora smaragdina* (Loew), ♂ genitalia. 51: Epandrium, posterior view; 52: Phallus.

half of face brown or shining black, with faint bronze sheen. Facial ridge with white microtrichose stripe fused with microtrichose bottom of antennal groove; parafacial with narrow white microtrichose stripe along anteroventral eye margin. Gena brown, shining, without microtrichose areas except at orbit. Occiput entirely shining black to dark brown; orbit between posterodorsal eye margin and row of black postocular setae shining black, without microtrichia. Setae as described for *P. alceae*. Antenna as in *P. alceae*, dark brown to black; flagellomere 1 1.5–1.7 times as long as wide. Clypeus shining black. Palpus black, microtrichose, with moderately long black setulae. Mouthparts black.

Thorax. Scutum and scutellum black, with dull green, blue or reddish metallic sheen, finely pitted, as described for *P. alceae*. Mesonotal scutum with pair of dorsocentral and intraalar rows of very fine whitish setulae with sockets hardly distinguishable among cellular sculpture; no acrostichal or dorsocentral seta; medial and supraalar setulae very fine, whitish and disperse, not forming regular rows. Other setae strong and black, as described for *P. alceae*. Scutellum without distinctive setulae, with 2 pairs of black setae.

Wing. As described for *P. alceae*; postero-apical extension of cell cup 2–3 times as long as vein CuA₂+A₁, and 1.5–2 times as long as transverse section of vein CuA₂.

Legs. Black, including whole foretarsus; mid- and hindtarsi creamy white to yellow; all setae black; forefemur postero-ventrally with 6–7 thickened, short setae in apical half; basal tarsomere on ventral surface with brush of creamy white setulae.

Abdomen. Both tergites and sternites black, tergites 1–4 shining, with very weak greenish reflection, male tergite 5 sparsely dotted, with bluish sheen and inconspicuous whitish setulae and microtrichia. Male postabdomen brown to black, epandrium (Plate 51) as in *P. sericea*; phallus glans (Plates 21, 52) similar to that of *P. sericea*. Female abdomen and terminalia not examined.

Distribution: Widespread in Africa (incl. Cabo Verde).



53

1 mm



54

1 mm

Plates 53–54. *Melieria nigritarsis* (Loew), ♀. 53: Left lateral view; 54: Dorsal view. (Photographs © James Turner / NMWC)

Subfamily **Otitinae** Aldrich, 1932Tribe **Otitini** Aldrich, 1932Genus **Melieria** Robineau-Desvoidy, 1830

Melieria Robineau-Desvoidy, 1830: 715. Type species: *Melieria gangraenosa* Robineau-Desvoidy, 1830: 716, by subsequent designation by Rondani, 1869: 8, 19.

Diagnosis: Antennae with flagellomere 1 acute, arista pubescent, mesonotum with 2–4 postsutural and usually with 1–2 presutural dorsocentral setae, wing with veins R_{4+5} and M parallel or divergent at apex; epandrium of male usually with elongate surstyli bearing 2–5 thickened setulae (prensisetae); female with sausage-like or oval prensisetae. Adult flies occur in association with *Artemisia maritima*, *Phragmites* spec. and *Typha* spec. along lakes, rivers and salty marshes.

Recognition: Hennig, 1939.

Distribution: The genus *Melieria* includes over 40 species occurring mainly in the Palaearctic and Nearctic Regions (see Kameneva, 1997, for references).

Melieria nigritarsis Becker, 1903

Plates 53–54

Specimens examined: Wadi Bih Dam, 1♀, 18–24.vi.2008, LT.

Recognition: This species can be recognized by the combination of presutural dorsocentral setae present, abdominal tergites uniformly sandy-gray microtrichose without brown posterior margins, wing with spotted pattern, including brown spot on R_{2-5} fork, and short pubescence of arista. The specimen reported was identified by J. Deeming, Cardiff, UK.

Distribution: Described from Egypt; recently recorded from Tunis, South of European Russia, Syria, Iraq, Iran, Turkmenistan, and Western China (Hennig, 1939), Kenya, Namibia, Nigeria (Steykskal, 1980) and from Republic of South Africa (Barraclough, 2000).

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Order Diptera, family Asteiidae

John C. Deeming

INTRODUCTION

This is a small family of acalyprate flies in which vein R₂₊₃ is very short and upcurved to the costa, there are no costal breaks, the subcosta is incomplete and the male postabdomen is asymmetrical. Very little is known of larval biology or life history. Species of *Leiomyza* Macquart, 1835, have been recorded as having been reared from fruiting bodies of fungi, and *Asteia* Meigen, 1830, from decaying plant material (Ferrar, 1987: 79). I have reared the common species *Asteia amoena* Meigen, 1830, as a seed fly and in company with the chloropid *Pseudopachychaeta ruficeps* (Zetterstedt, 1838) from pupae in panicles of the sedge *Eriophorum angustifolium* in the Hensol Forest, South Wales in July 1982. It would appear that no records of this family occur for the Arabian Peninsula. Although not yet found in the UAE, a further Arabian species, *Asteia decepta* Becker, 1908, is treated here for convenience.

Care must be taken in the examination of the aedeagus. This is of very complicated structure and the interpretation of its parts is often difficult. Furthermore, it can present a very different appearance according to the angle from which it is viewed. It becomes evident that the structure of the ejaculatory apodeme is a valuable character in specific diagnosis. Although *Asteia amoena* Meigen has not been found in the Arabian Peninsula (as demarcated by a line running from Aqaba to the mouth of the Euphrates) this is figured here (Fig. 1) for purposes of comparison. In this paper the figures of ejaculatory apodemes are given with the end that is more basally situated in the abdomen uppermost. Sueyoshi (2003), in revising the Japanese species of *Asteia*, described female postabdomens, which, apart from spermathecae, had never been described. He states that the internal structures are entirely membranous in the species he encountered and are, therefore, difficult to see, but he described a group of short peg-like setae on tergite 7 in two species.

MATERIALS AND METHODS

The material here cited is entirely dry-mounted and is deposited in the National Museum of Wales (NMWC) and the United Arab Emirates Invertebrate Collection, apart from the Bahrain specimens, which are in the Oxford University Museum and the material of Jens-Hermann Stuke, which is in his personal collection. The material of *Asteia inanis* used for comparison and which is figured here is from France (2♂, 2♀, Perpignan, St. Cyprian beach and lagoon, 12.vi.2007, leg. J.C. Deeming), and that of *Asteia amoena* Meigen from Lebanon (1♂, Nahr el-jaws (Baksmaya), 1.vi.2001, leg. J.C. Deeming). Dissections are preserved in glycerine in van Doesburg tubes pinned under individual specimens.

Abbreviations: AvH = leg. A. van Harten; NARC = National Avian Research Centre; HC = hand collected; LT = light trap; MT = Malaise trap; WT = water trap.

SYSTEMATIC ACCOUNT

Key to Arabian Asteiidae

1	Combination of arista being reduced to a stub, third antennal segment with long hairs and posterior crossvein present	<i>Anarista vittata</i> Sabrosky*
-	Arista as long as or longer than third antennal segment	2
2	Posterior crossvein present	3
-	Posterior crossvein absent	4
3	Much of dorsum of mesonotum of black ground colour	<i>Phlebosotera lacteipennis</i> Hendel
-	Dorsum of mesonotum with only orange markings that are not very much darker than the ground colour	<i>Phlebosotera striata</i> Becker
4	Mesonotum shiny, black, in strong contrast to the yellow scutellum. Head higher than long	5
-	Mesonotum distinctly dusted and with a pattern of darker longitudinal lines. Head longer than high	7
5	Arista bare. Mid and hind legs with dark markings	<i>Asteia decepta</i> Becker
-	Arista with zigzag rays. Legs entirely yellow	6
6	(Males only) Anterior extremity of aedeagal apodeme hardly wider than the shaft	<i>Asteia arabica</i> Deeming nov. spec.
-	Anterior extremity of aedeagal apodeme greatly widened, appearing in shape like the tail of a whale	<i>Asteia afghanica</i> Papp
7	Mesonotum heavily grey dusted. Vein R4+5 meeting costa at a right angle	<i>Asteia caesia</i> Lyneborg
-	Mesonotum brown and yellow vittate. Vein R2+3 meeting costa in a gentle curve	<i>Asteia vanharteni</i> Deeming nov. spec.

* A combination of these unusual antennal characters with the lack of a posterior crossvein signifies the Mediterranean subgenus *Subanarista* Papp, 1979, of *Asteia* Meigen, 1830.

Phlebosotera lacteipennis Hendel, 1931

Plate 1

Specimens examined: Al-Ajban, 4♂, 6♀ 17.x.-9.xi.2005, MT, AvH; 1♀, 9-16.xi.2005, MT, AvH; 2♀, 9.xi-7.xii.2005, LT, AvH. Wadi Bih dam, 1♂, 6-17.iii.2008, LT, AvH. OMAN: Muscat, Seeb airport beach, 1♂, 13.xi.1990, leg. M.J. Ebejer. YEMEN: Al Kowd, iv.2000, 2♂, LT, leg. AvH & S. Al Haruri. Distribution: Described from the Red Sea coast of Egypt.

Phlebosotera striata Hendel, 1931.

Specimens examined: Al-Ajban, 1♂, 10-17.x.2005, MT, AvH; 1♂, 17.x-9.xi.2005, MT, AvH; 9♂, 7♀, 16-23.xi.2005, LT & MT, AvH. Sharjah, 1♂, 28.vi-23.vii.2005, LT, AvH. Sharjah Desert Park, 2♂, 20.x-24.xi.2007, LT, AvH. NARC, near Sweihan, 1♂, 16.xi-21.xii.2005, LT, AvH. SEYCHELLES: Aldabra Island, Picard, 1♂, 1974-1976, leg. R. Prys-Jones.

Distribution: Described from the Red Sea coast of Egypt.

Anarista vittata Sabrosky, 1977

Plates 2-3

Specimens examined: N of Ajman, 2♀, 11-25.xi.2006, WT, AvH. Sharjah Desert Park, 1♀, 25.i-22.ii.2005, LT, AvH; 1♂, 20.x-24.xi.2007, LT, AvH. OMAN: Salalah, Dahareez, 7♀, 9.x.1990, leg. J.C. Deeming; 4♂, 42♀, 12.x.1990, sweeping grasses and chenopods in coconut grove, leg. J.C. Deeming. NIGERIA: Lagos State, Tarkwa Bay, 1♂, 1♀, 10.ii.1974, leg. M.A. Cornes.

Distribution: This is a very little-known species described from a single male from St. Helena and of which I know of no further records.



Plate 1. *Phlebosotera lacteipennis* Hendel, male from al-Ajban, lateral aspect. (Photograph © James Turner / NMWC)

[*Asteia amoena* Meigen, 1830]

Described from Germany and widely distributed in the Palaearctic Region, some confusion exists as to the identity of this species, at least two species having been recorded under this name. Dr. Papp informs me that he has been aware of this for some time, but unfortunately the holotype is a female. The male genitalia as figured by Papp (1978: 93, figs. 7–8) and Merz (1996: 899, figs. 10–13) are quite different. All the material that I have seen (British Isles, Ibiza, Lebanon) is of the latter type. The ejaculatory sclerite of this species is figured (Fig. 1) in comparison to that of *A. afghanica* Papp (Fig. 2).



Plates 2–3. *Anarista vittata* Sabrosky, female, Dahareez. 2: Dorsal aspect; 3: Lateral aspect.
(Photographs © James Turner / NMWC)

Asteia caesia Lyneborg, 1969

Plates 4–5

Specimens examined: Al-Ajban, 1♀, 17.x–9.xi.2005, MT, AvH. Ajman, 9 m a.s.l., on moist soil between mangrove and saltmarsh plants, 2♂, 2♀, 21.iii.2007, leg. A. Stark. N of Ajman, coast, 1♂, 1♀, 11.iii.2008, leg. J.-H. Stuke; dunes with Mangrove, *Avicennia marina*, 5♂, 5♀, 11.iii.2008, leg. J.-H. Stuke. 7 km S of Al-Jazirat al-Hamra, 11♂, 12♀, 27.ii.2006, HC, leg. J.C. Deeming. Qurayyah, beach, 1♀, 13.iii.2008, leg. J.-H. Stuke. Ra's al-Khaimah, 1♂, 2♀ 11.iii.2008, leg. J.-H. Stuke. Sharjah, 4♂, 6♀ 24.ix–9.x.2005, LT, AvH. Sharjah Desert Park, 12♂, 5♀, 20.x–24.xi.2007, LT, AvH. Um al-Quwain, beach, 4♂, 3♀, 18.iii.2008, HC, leg. J.-H. Stuke. Um al-Quwain, salt marsh, 1♀, 18.iii.2008, leg. J.-H. Stuke. Wadi Bih dam, 1♂, 6–17.iii.2008, LT, AvH. Wadi W Mirba, mountain oasis, 25°16'N 56°17'E, 1♂, 13.iii.2008, HC, leg. J.-H. Stuke. BAHRAIN: Adhari Pool area, irrigated farms and ditches, 1♀, 4.vi.2000, HC, leg. C.R. Turner. OMAN: Muscat, Al Khuwair, 13♂, 14♀, x.1990, HC, leg. J.C. Deeming. Muscat, Qurum beach, 2♂, 5♀, 23.x.1990, HC, leg. J.C. Deeming. Muscat, Seeb dunes, 2♂, 2♀, 22.x.1990, LT, leg. M.D. Gallagher & J.C. Deeming. Muscat, Seeb marsh, 1♀, 13.xi.1990, M.J. Ebejer & M.D. Gallagher. Muscat, coastal dunes near Gubrah, 1♂, 30.x.1990, LT, leg. M.D. Gallagher & J.C. Deeming. Wadi Bani Kharus, foothills of Jebel Akhdar, Ulyah, 810 m, 1♂, 18.x.1990, HC, leg. M.D. Gallagher & J.C. Deeming. Wahiba Sands, 22°21'N 58°51'E, 3♀, 25.x.1990, leg. M.D. Gallagher & J.C. Deeming. Wahiba Sands, *Prosopis* woodland, 21°39'N 59°18'E, 2♀, 4.x.1994, LT, leg. M.D. Gallagher & G. Lowe. Ra's al Ghubbah, 1♀, 19.iv.1997, LT, leg. M.D. Gallagher. Shinas, mangrove creek, 3♂, 4♀, 9.vi.1994, LT, leg. M.D. Gallagher. YEMEN: Aden-Little Aden, 1♂, 10–12.iv.1993, HC, AvH. Al-Kowd, 2♂, 12♀, vii.1999, LT, leg. AvH & S. Al Haruri; 1♂, 6♀, viii.1999, LT, leg. AvH & S. Al Haruri; 3♂, 1♀, iv.2000, LT, leg. AvH & S. Al Haruri. Mayfa'ah, 3♂, 2♀ 26–28.v.1998, LT, leg. A. van Harten & M. Afif.

Distribution: This species was described from a single female from Almeria, Spain, and has been collected by Dr. M. Báez on Tenerife. One female from the Wahiba Sands has one of its antennae with the third segment of normal shape and the other triangular, as is figured by Lyneborg (1969: 39, fig. 17) for the closely-related *A. ibicana* (Enderlein, 1935) from the island of Ibiza. This casts doubt in my mind as to the validity of the shape of the third antennal segment as a diagnostic character.

Asteia afghanica Papp, 1979

Plate 6, Figures 2–3

Specimens examined: Bithnah, 1♂, 16.xi–26.xii.2006, MT, AvH. Desert Farm, 25°08'N 55°45'E, 1♂, 1♀, 12.iii.2008, HC, leg. J.-H. Stuke. SSW of ad-Dhaid, 1♀, 13–18.xii.2005, LT, AvH. Fujairah, 1♀ (Laboulbeniales-infested, W. Rossi prep. No. 3324), 1–8.iv.2006, LT, AvH. 7 km S of al-Jazirat al-Hamra, 1♂, 29.xii.2004, WT, AvH. Masafi, farm, 25°19'N 56°08'E, 4♂, 17.iii.2008, HC, leg. J.-H. Stuke. Ra's al-Khaimah, farm, 25°48'N 56°04'E, 2♂, 16.iii.2008, HC, leg. J.-H. Stuke. Sharjah Desert Park, 11♂, 3♀, 25.i–22.ii.2005, LT, AvH; 1♀ 28.ii.2006, HC, leg. J.C. Deeming; 2♂, 20.x–24.xi.2007, LT, AvH. NARC, near Sweihan, 1♀, 2–30.iv.2005, LT, AvH. Wadi Shawkah, 1♂, 14.iii.2008, leg. J.-H. Stuke. OMAN: Batinah, Al Mawaleh, on poorly cultivated grass, 1♂, 2♀, 14.ii.1992, HC, leg. M.D. Gallagher. Batinah, Shinas, on *Mormondia charantia*, 1♂, 7.xii.1992, HC, leg. J.C. Deeming. Batinah, Sohar, on forage *Pennisetum*, 5♂, 3♀, 6.xii.1992, HC, leg. J.C. Deeming. Batinah, Rumais, weedy egg plant plot, 2♂, 1♀, 5.xii.1992, HC, leg. J.C. Deeming; on beet spinach, 1♂, 4.xii.1992, HC, leg. J. Deeming. Dhofar, Mughsail, salt marsh, in *Sporobolus virginicus* habitat, 1♀, 11.x.1990, HC, leg. J.C. Deeming. Dhofar, Ain Hamran, streamside vegetation, 1♂, 10.x.1990, HC, leg. J.C. Deeming. Dhofar, Salalah, Dahareez, tomato plot, 1♂, 8.xi.1992, HC, leg. J.C. Deeming. Hayl al Ghaf, weedy cultivation under palms, 2♂, 4♀, 6.xi.1992, HC, leg. M.D. Gallagher & J.C. Deeming. Muscat, 9♂, 5♀, 9.i.1988, leg. M.J. Ebejer. Muscat, Al Khuwair, on grass in damp wadi bed near beach, 4♂, 2♀, 15.i.1997, HC, leg. M.D. Gallagher. Nakhl, weedy date palm grove, 1♂, 18.x.1990, HC, leg. M.D. Gallagher & J.C. Deeming. SAUDI ARABIA: Aseer, Maraba, 4♂, 15.x–30.xi.2004, MT, leg. H.A. Dawah. YEMEN: Dhamar, alfalfa field, 1♀, 13.iii.1991, HC, leg. AvH, H. Mahdi & M. Mahyoub. Sana'a, 1♂, vi.1999, LT, AvH. Ta'izz, 1♀, 5.i–2.ii.1998, LT, leg. AvH & M. Mahyoub.

Distribution: Described from several localities in Afghanistan. I know of no further records.



Plates 4–5. *Asteia caesia* Lyneborg from Ajman. 4: Female; 5: Male. (Photographs by A. Stark, Halle, Germany)



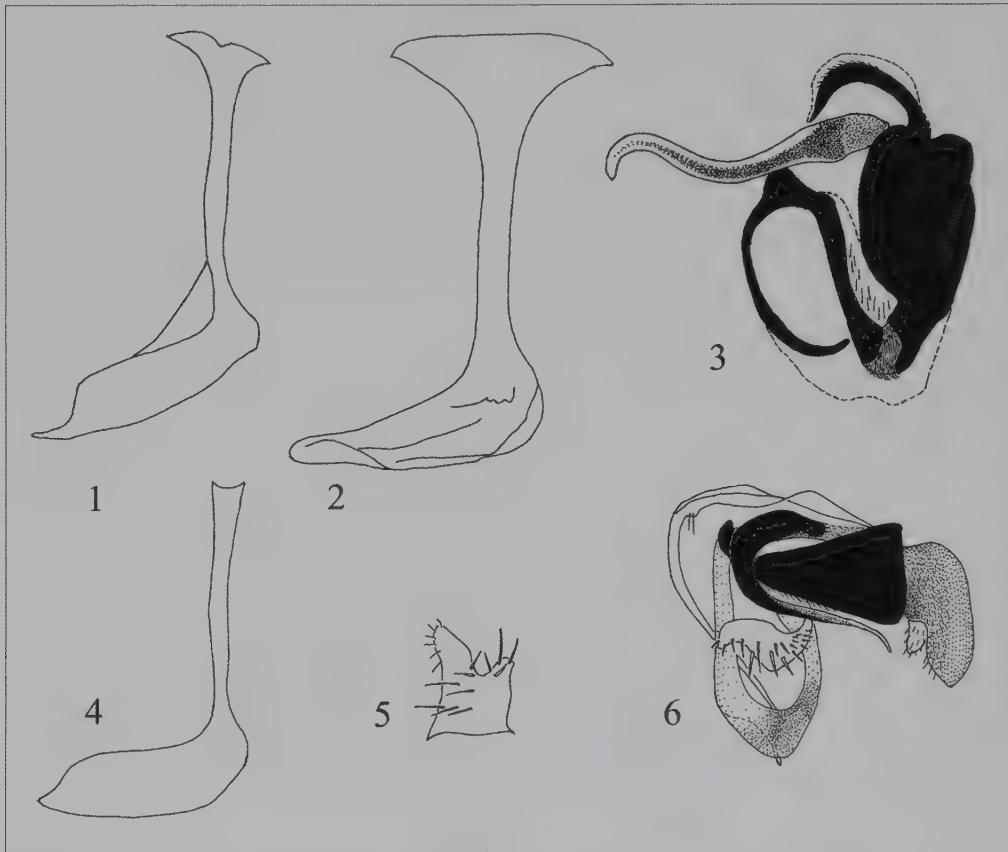
Plate 6. *Asteia afghanica* Papp, male from Muscat. (Photograph © James Turner / NMWC)

Asteia arabica Deeming nov. spec.

Figures 4–6

Specimens examined: Holotype: ♂, United Arab Emirates, Sharjah Desert Park, 25°17'N 55°42'E, 28.ii.2006, hand collected, leg. J.C. Deeming (NMWC).

Description: Male. Head higher than long, in profile the eye occupying almost the entire height, the gena linear; frontal stripes extending forwards as far as an imaginary line drawn between anterior ocellus and the single large orbital bristle, this stronger than and as long as the internal and external verticals and vibrissa, the ocellar bristles short, proclinate and very weak; arista with three long rays above and two below and apical fork, the longest of these rays being as long as the second antennal segment; the pale facial band separated from the mouth margin by a very narrow black band and having a broader infuscation above it; clypeus

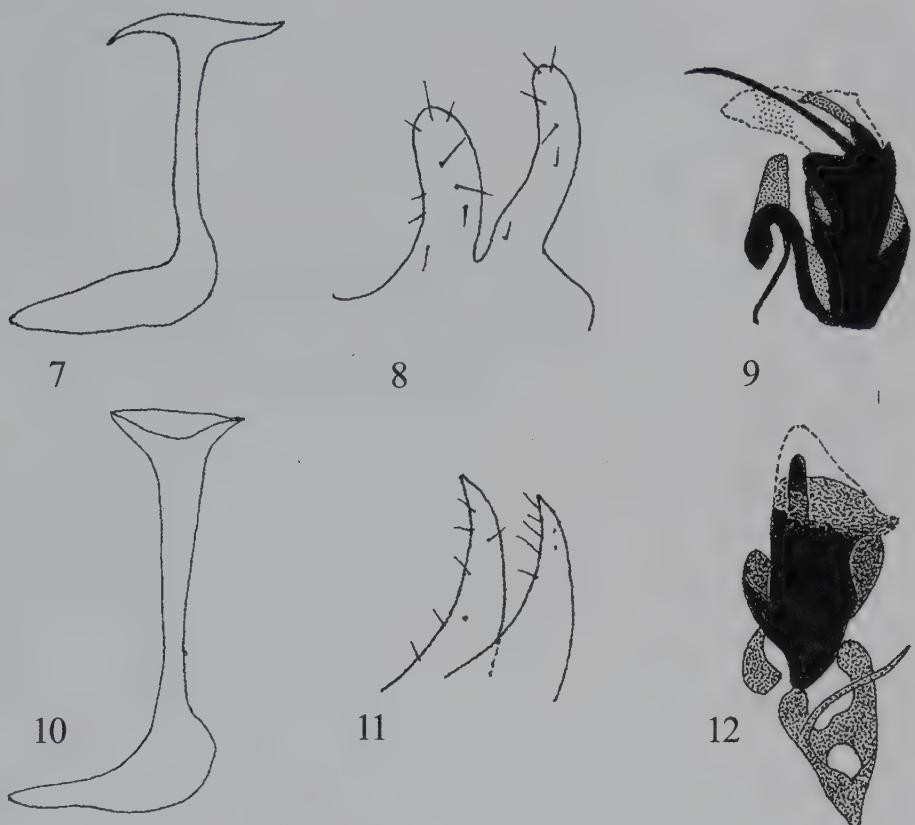


Figures 1–6. 1: *Asteia amoena* Meigen, male from Nahr el-jaws, ejaculatory apodeme; 2–3: *Asteia afghanica* Papp, male from Muscat. 2: Ejaculatory apodeme; 3: Aedeagus. 4–6: *Asteia arabica* Deeming nov. spec., male holotype, Sharjah Desert Park. 4: Ejaculatory apodeme; 5: Surstylos; 6: Aedeagus.

black; gena, proboscis and palpus yellow. Thorax with two notopleural bristle, the more anterior of which is extremely short and weak; 2 upper sternopleural bristles; scutellum with the long apical pair of bristles preceded by a pair of minute hairs laterally situated. Wing with light brown veins; R₂₊₃ forming a regular curve, joining costa at same point as R₁. Legs only black on claws; fore femur with the usual long posterior bristle at mid length. Abdomen with tergites pale and largely membranous; tergite 2 with a part of indefinite infuscate markings anterolaterally; tergite 5 with a pair of dark spots; epandrium small; surstylos (Fig. 5) deeply emarginate, with both lobes on the same plane, the posterior lobe being the longer, and with long setae on both outer and inner surfaces; aedeagus (Fig. 6) of complicated structure; ejaculatory apodeme (Fig. 4). Length c.1.9 mm, of wing 2 mm.

Female unknown.

Remarks: This species is very similar to *A. amoena* Meigen, 1830, *A. afghanica* Papp, 1979, and *A. algeriensis* Sabrosky, 1956, having the arista conspicuously zigzag rayed, a broad pale transverse facial stripe, which is of a transparent yellow rather than the heavily sclerotized ivory white of *A. amoena*, two pairs of long dorsocentral bristles, the convex mesonotum, humerus, notopleuron and all but the fore margin of the frons shining black, the postalar



Figures 7–12. 7–9: *Asteia vanharteni* Deeming nov. spec., male from Bahrain. 7: Ejaculatory apodeme; 8: Surstylus; 9: Aedeagus. 10–12: *Asteia inanis* Lyneborg, male from Perpignan. 10: Ejaculatory apodeme; 11: Surstylus; 12: Aedeagus.

callus, pleura apart from an infuscate upper sternopleural band, legs and scutellum yellow, the notopleuron black, the wing lacking any infuscation at junction of R₂₊₃ with costa and the knob of the haltere largely infuscate. From the first two of these species it differs in the structure of the aedeagus and ejaculatory apodeme, and from the last species in having the male frontal stripes (a secondary sexual character limited to males) very much shorter (see Sabrosky, 1956: 243, fig. 2).

Asteia vanharteni Deeming nov. spec.

Specimens examined: Holotype: ♂, United Arab Emirates, Bithnah, 25°11'N 56°14'E, 16.xi–26.xii.2006, in Malaise trap, leg. A. van Harten (NMWC). Paratypes: 1♂, 1♀, same data as holotype. 1♀, Sharjah, 24.ix–9.x.2005, LT, AvH. 4♂, 1♀, Sharjah Desert Park, 3♂, 1♀, 10.xi.2004, at light, AvH; 20.x–24.xi.2007, LT, AvH. BAHRAIN: 1♂, 5♀, Adhari Pool area, farms and ditches, 4.vi.2000, HC, leg. C.R. Turner. OMAN: 2♀, Dhofar, Salalah, Dahareez, grasses and chenopods, 12.x.1990, HC, leg. J.C. Deeming; 7♂, 6♀, same data but 9.xi.1992.

Plates 7–8, Figures 7–9



Plates 7–8. *Asteia vanharteni* Deeming nov. spec., male from Bandar al Jissah. 7: Dorsal aspect; 8: Lateral aspect. (Photographs © James Turner / NMWC)

1♂, 1♀, Muscat, Bandar al Jissah, 26.x.1990, LT, leg. M.D. Gallagher & J.C. Deeming; 1♀, same data but 10.xii.1992. 1♀, Muscat, Haramel, 28.iii.1995, leg. S.P. Dance. 4♀, Muscat, Al Khuwair, 15.i.1997, on grass in damp wadi bed near beach, HC, leg. M.D. Gallagher. 2♂, 9♀, Muscat, Seeb marsh, 13.xi.1990, leg. M.J. Ebejer & M.D. Gallagher. 3♂, 2♀, Muscat, Seeb dunes, 22.x.1990, LT, leg. M.D. Gallagher & J.C. Deeming. YEMEN: 1♀, al-Kowd, vii.1999; 1♂, viii.1999; 1♀, iv.2000; all LT, leg. AvH & S. Al Haruri. 2♂, Ta'izz, 5.i–2.ii.1998, LT, leg. AvH & M. Mahyoub; 1♂, ix.1999, leg. AvH & A. Awad.

Differential diagnosis: This species is very similar to *Asteia inanis* Lyneborg, 1969, described from a single male from Spain (1969: 35) and differs from that description only in the following respects. In general appearance it resembles it except in having the scutellum, rather than being whitish yellow in contrast to the deeper yellow mesonotum, of the same ground colour as the mesonotum and in most specimens with a more or less developed darker smudge on all of dorsum of scutellum apart from its margins and also in having the mesonotum slightly more heavily dusted. In the new species the distiphallus is much longer (Fig. 9) and the ejaculatory apodeme (Fig. 7) of a different shape to that of *A. inanis* (compare Figures 10 and 12 with these). In both species the apical phallic membrane bears numerous close-set short rows of spicules. The two lobes of the surstyli, though more pointed in shape in *A. inanis* (Fig. 11), are very much more robust and apically rounded in the new species (Fig. 8). Furthermore, in *A. inanis* the two lobes of the surstyli are on different planes, the more anterior lobe lying outside the more posterior lobe. The same division of the surstyli into two such lobes is figured by Sabrosky (1987: 901, fig. 9) for *Leiomyza laevigata* (Meigen), so such a development is not unique within the family. Otherwise, the new species agrees well with the original description of *A. inanis*. The female postabdomen lacks any specialized chaetotaxy. Though *inanis* is described as having a single orbital bristle, in both the material of *A. inanis* available to me and the new species this is very short and hairlike.

Asteia floricola Papp, 1978, described from Tunisia, is also similar, but differs from the new species in having the eye very much more long-elliptical (compare Papp, 1978: 95, Fig. 1 with Plate 7 of this paper), the male frontal stripes shorter, reaching only to mid-length of frons, rather than the three quarters of length in the new species. The holotype of *Asteia inanis* is described as having the interfrontal stripes difficult to see due to the frons being somewhat shrunken, but in the specimens from Perpignan these are at least two thirds of the length of the frons.

Asteia decepta Becker, 1908

Specimens examined: YEMEN: Ta'izz, 2♂, 2♀, ix.1999, LT, leg. AvH & A. Awad. CAPE VERDE: São Jorge dos Orgãos, 1♀, iv.1986, HC, AvH.

Distribution: This species was described from the Canary Islands and is further recorded from Cape Verde Islands.

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I am most grateful to Tony van Harten, Martin Ebejer, Michael Gallagher, Hassan Dawah, Andreas Stark, Jens-Hermann Stuke, Clive Turner and Peter Dance for collecting the material studied and passing it to me. Laszlo Papp very kindly gave me advice on *Asteia amoena*. Martin Ebejer kindly read the manuscript of this paper and made useful suggestions for changes. The whole insect photographs were taken by James Turner, apart from those of *Asteia caesia*, which were made by Andreas Stark.

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Order Diptera, family Canacidae (Part 2)

Lorenzo Munari

INTRODUCTION

This second contribution to the Diptera Canacidae from the United Arab Emirates (for the first contribution, see Munari, 2008a) includes the descriptions of two new species of *Tethina* as well as some new or interesting records of species belonging to the subfamilies Canacinae, Tethininae, and Zaleinae. As the Canacid fauna of this small Arabian country cannot prescind from the knowledge of the considerably similar fauna of the adjacent territories of Qatar (Munari, 2005) and Oman (Munari, 2007), some interesting new finds from the latter country are also recorded in the present work in order to better understand the zoogeographical affinities of this eastern part of the Arabian Peninsula with other zoogeographical areas (see Conclusions and Figure 5).

During the last years a number of further Canacidae were collected in the UAE, in particular by Mr. A. van Harten (Sharjah, UAE), Dr. J.C. Deeming (Cardiff, UK), and Dr. J.-H. Stuke, (Leer, Germany), by using aerial net, water traps, and at light. Most specimens and species collected in the UAE belonged to the subfamily Tethininae. Although the specimens belonging to the subfamily Canacinae (*sensu* McAlpine, 2007) were not particularly numerous in the collected material, a significant representative sample of these beach flies from the UAE and the neighbouring Oman became also available for examination.

MATERIALS AND METHODS

The standards of preparation and preservation of the material treated in this work, the methods adopted for their study as well as the customary protocols for the descriptions of new species are mostly the same as the preceding first contribution (Munari, 2008a). All species recorded from the UAE are in bold italics, whereas the species only reported from the neighbouring Oman, but expected to be found in the UAE, are in unbold italics and in brackets. All the diacritical marks from Arabic are omitted in the text.

The holotypes of the two new species were deposited in the collection of the National Museum of Wales, Cardiff, UK (NMWC). The other specimens were divided between the Museo di Storia Naturale, Venice, Italy (MCNV), the United Arab Emirates Invertebrate Collection, UAE, Jens-Hermann Stuke's collection (Leer, Germany), and the NMWC.

Abbreviations used in text: LT – light trap; MT – Malaise trap; WT – water trap; AvH – leg. A. van Harten.

TAXONOMIC ACCOUNT

Subfamily *Canacinae* Jones, 1906

Nocticanace affinis Munari, 2008

Specimens examined: Um al-Quwain, beach, 1♂, 18.iii.2008, leg. J.-H. Stuke; ‘park’ at beach, 1♀, 18.iii.2008, leg. J.-H. Stuke.

Remarks: This species was recently described from the neighbouring Oman (Munari, 2008b). The records from the UAE constitute the second finding of this species and corroborate its occurrence in the eastern territories of the Arabian Peninsula.

Distribution: Palaearctic: Oman. New to the UAE.

Xanthocanace hamifer Munari, 2008

Specimens examined (previously published): Qurayyah, 7♂, 1♀ [type series], 19.iii.2007, leg. F. Menzel & A. Stark.

Remarks: Considering the external morphology and colouration, this species is strongly similar to *Xanthocanace zeylanica* Delfinado, 1975. It consistently differs, though, from Delfinado's species mainly by the bright yellowish face, the proximal segments of arista noticeably elongated and thickened, sausage-shaped, reddish brown (remaining segments very thin and pale, hairlike), and for having a quite peculiar surstylus, which is typified by a hooked process, in both lateral and caudal views (Munari, 2008b, Figs 8–9).

Distribution: Palaearctic: United Arab Emirates.

[*Xanthocanace kaplanorum* Mathis & Freidberg, 1982]

Specimens examined: OMAN: Al Nuqdah, 20°51.51'N, 58°44.37'E, sandy beach crest, 4♂, 8♀, 23.ix.1995, leg. M.D. Gallagher & G. Lowe.

Remarks: In his 'World catalog of the beach-fly family Canacidae', Mathis (1992) recorded this species from Oman. As far as I know this citation was probably made in an informal manner, as this record had never been published previously. Furthermore, the specimens examined herein were formerly determined (in 1992) by Mathis himself, that is to say in the same year in which his catalogue was published as well. In my opinion, he possibly quoted this species from Oman on the basis of personal observations and not from a previously published record. Therefore, the specimens quoted herein represent the first formal citation of this species from Oman (for further details on the validity of this species, see the 'Remarks' section under the following species).

Distribution: Palaearctic: Egypt (Sinai), Oman.

***Xanthocanace sabroskyi* Mathis & Freidberg, 1982**

Specimens examined: N of Ajman, 7♂, 7♀, 16.ix–22.x.2006, 16–22.xi.2006, WT, AvH; 8♂, 19♀, 21.ix–25.x.2007, WT, AvH. N of Ajman, dunes with mangrove *Avicennia marina*, 1♂, 6♀, 11.iii.2008, leg. J.–H. Stuke. Fujairah, coastal salt marsh, 1♂, 1♀, 22.ii.2006, at light, leg. J.C. Deeming. 2 km S of Kalba, mangroves, 1♀, 26.ii.2006, leg. J.C. Deeming. Qurayyah, 14♂, 16♀, 19.iii.2007, leg. F. Menzel & A. Stark. OMAN: Muscat, Bandar al Jissah, 1♂, 29.x.1990, m.v. light, leg. M.D. Gallagher & J.C. Deeming; Muscat, Seeb dunes, 1♀; 21.x.1990, m.v. light, leg. M.D. Gallagher & J.C. Deeming. Shinass, in mangrove creek, 24°43'N 56°28'E, 5♂, 4♀, 9.vi.1994, at light, leg. M.D. Gallagher.

Remarks: Mathis and Freidberg (1982) described two new species of *Xanthocanace* from Sinai, *X. kaplanorum* and *X. sabroskyi*. The two species differ from each other mainly by a peculiar character of the mesofrons of male, which is dull (densely microtomentose) in the former species, shiny or subshiny in the latter species. However, the male terminalia are strongly similar, if not almost identical, in both species, although the illustrations given by the two authors show seemingly different morphological patterns. The females are not separable at the species level, as they have the mesofrons homogeneously microtomentose in both taxa. They can be tentatively identified only if strictly associated with males. The two species are found sympatrically, and often syntopically, throughout their area of distribution.

Mathis and Freidberg's (1982) figures of the male terminalia of *X. sabroskyi* display the lateral outline of the epandrium and surstylus in an evident, incorrect perspective, probably due to misplacement of the piece in glycerol. In a personal communication, Mathis himself admitted that those illustrations are inadequately informative and partially misleading. After long discussion with the authors of the new species, one of them (W.M.) stated he was convinced about the validity of these two species, since he observed, together with A. Freidberg, that "the specimens are maintaining strict segregation and the characters, even though subtle, seem to apply". The two colleagues also noticed a strict segregation among

syntopic individuals in copula (personal communication). Of course, these interesting observations refer to specimens from the Sinai, which currently form the type series. Nevertheless, I think the characters of mesofrons could be differently interpreted if considered on a wider, distributional scale. As a matter of fact, the specimens from the Sinai indicate the two species are well distinct exclusively on the basis of the character state "mesofrons dull/mesofrons shiny", no transitional form having been found at that place. However, additional material from the Arabian Peninsula reveals that this character state exhibits variation in many specimens from some localities of the UAE and Oman. In specimens from Ajman (UAE), I have found that this character state seem to be strongly variable and the differences above-mentioned often appear quite inconsistent, as many individuals show a distinct transition between the two species. In fact, these specimens have the male mesofrons from noticeably shiny to densely microtomentose (even if always with markedly silvery reflections), without any solution of continuity. I have observed specimens with faint, although homogeneously distributed, microtomentum, others having dense microtomentosity, but with lucid reflections, still others bearing dense tomentosity that allows, however, to glimpse the underlying shiny cuticle of the mesofrons. In other words, I have found no pattern similar to that noticed for the type series from the Sinai. Of course, the clinal extremes in all of the specimens examined clearly exhibit individuals with strongly shiny mesofrons and, conversely, individuals having dull mesofrons, with dense microtomentum. Considering this variable character state along with the very slight, inconsistent differences in the morphology of the male terminalia, I strongly suspect these two taxa could indeed be conspecific or even point out a phenomenon of hybridization in the southern territories of the Arabic Peninsula. Obviously, our present, limited knowledge of these species prevents us from discussing this last hypothesis further.

The specimens from the UAE can be subdivided into two morphotypical groups, viz. a first group characterized by individuals slightly larger, distinctly darker, olivaceous brown, with mesonotum, including scutellum, bearing strong, black setae and setulae, and with mesofrons of the male markedly shiny. The second group shows instead individuals smaller, entirely covered with light grey to olivaceous grey microtomentum, with mesonotal setae and setulae distinctly weaker, fully depigmented, and mesofrons of the male shiny to very confusedly subshiny, sometimes nearly dull with silvery reflections. Nevertheless, both the groups have identical external terminalia of male. These exhibit the distal half of the surstyli slenderer than the type specimens from the Sinai – I have also studied a paratype male of this species deposited in MCNV – with the apical part slightly, although distinctly, longer, more sharply pointed and narrower. In the paratype male I have examined this part appears distinctly stumpery, with an imperceptibly swollen apex. These minor differences are probably due to geographical variation.

With regard to the specimens belonging to the first group, that is those bearing black setae and setulae, it should be stressed that in a few species of the subfamily Tethininae, namely *Tethina albisetulosa* (Strobl, 1900), *T. albula* (Loew, 1869), and *T. willistoni* (Melander, 1913), many individuals that normally occur in nature with very pale, depigmented setulation, small size, and light grey microtomentum, often exhibit the setal vestiture of the head and thorax partially to fully black, with microtomentum noticeably darker (Mathis & Foster, 2007; Munari & Canzoneri, 1992; Munari & Vanin, 2007). Furthermore, their size is strongly variable, and several individuals of both morphotypes are syntopic and synchronic in the same habitats. Like these Tethininae species also *Xanthocanace sabroskyi* is probably influenced by similar chaetochromatic and size variations.

In conclusion, I prefer to maintain herein, at least for the time being, Mathis and Freidberg's (1982) taxonomical concept for these two species, although I consider their separation somewhat doubtful and in a few cases really puzzling.

Distribution: Palaearctic: Egypt (Sinai). New to Oman and the UAE.

[*Xanthocanace zeylanica* Delfinado, 1975]

Specimens examined: OMAN: Muscat, Bandar al Jissah, 1♀, 29.x.1990, m.v. light, leg. M.D. Gallagher & J.C. Deeming.

Remarks: The specimen examined is a female with the mesofrons distinctly subshiny and with all femora cinereous grey in the proximal four-fifths, the apical part being bright yellow as the tibiae and tarsi. New to Oman and first record from the Palaearctic Region.

Distribution: Oriental: Sri Lanka; Palaearctic: Oman (new).

Subfamily **Tethininae** Hendel, 1916 [as family]

***Dasyrhicnoessa ferruginea* (Lamb, 1914)**

Specimens examined: Al-Ajban, 1♂, 9.xi-7.xii.2005, MT, AvH. N of Ajman, 2♀, 16.ix-22.x.2006, WT, AvH. Sharjah Desert Park, 1♂, 20.x-8.xi.2005, WT, AvH.

Distribution: Afrotropical: Kenya, Madagascar, Seychelles. South Indian Ocean Islands: Amsterdam Island. Australasian/Oceanian: Australia, Caroline Islands, Mariana Islands, Palau, Papua New Guinea. Oriental: China, Malaysia, Philippines. Palaearctic: Oman. New to the UAE.

***Dasyrhicnoessa fulva* (Hendel, 1913)**

Specimens examined: N of Ajman, 3♂, 5♀, 16.ix-22.x.2006, 11-25.xi.2006, WT, AvH; 3♂, 11♀, 21.ix-25.x.2007, WT, AvH.

Remarks: The terminalia of the male specimens from the eastern territories of the Arabian Peninsula (UAE, Oman) exhibit slight variation in structure of the anterior surstyli, which is perceptibly oriented inwardly and distinctly shorter and smaller, nearly rudimentary, than the specimens from Sri Lanka and Taiwan (Munari, 2002). This Oriental species was very recently recorded from Oman (Munari, 2007).

Distribution: Oriental: Sri Lanka, Taiwan. Palaearctic: Oman. New to the UAE.

***Dasyrhicnoessa* cf. *tripunctata* Sasakawa, 1974**

Specimens examined: N of Ajman, 1♀, 21.ix-25.x.2007, WT, AvH.

Remarks: The female specimen examined is tentatively assigned to *D. tripunctata* Sasakawa, 1974, rather than *D. adelpha* Munari, 2005, the latter species recently described from the southwestern Indian subcontinent (district of Goa). This attribution is exclusively due to the brighter colour of the head, which is yellowish, as in Sasakawa's species, rather than dark brown as in *D. adelpha*. However, the colour of the thorax is noticeably lighter, yellowish, than in both species mentioned above. On the other hand, it should be stressed that the chromatic features of the head in this genus are rather inconsistent and often somewhat variable. The black spotted abdomen is, nevertheless, a very reliable feature for a safe attribution of this single female to the one or to the other of these species. From a distributional point of view it would be more believable to assign this specimen to *D. adelpha*, which I assume to be the vicariant species of the easternmost *D. tripunctata*, the latter being widely distributed in many places of the western Australasian/Oceanian Region, but never recorded from the Indian Ocean seashores. However, the Indian species is particularly typified, besides the different male terminalia, by the peculiar dark brown frons

and gena, a character state that was exclusively noticed in the specimens forming the type series, that is in the only specimens known so far. Although unwillingly, I am unable to give a different attribution to this female specimen as no male has been found in the material examined. The matter will be easily solved when additional material becomes available for examination.

Distribution (of *D. tripunctata*): Australasian/Oceanian: Australia, Caroline Islands, Mariana Islands, Papua New Guinea. Oriental: Japan (Ryukyus), Malaysia, Philippines.

***Tethina callosirostris* Munari, 2008**

Specimens examined: Al-Ajban, 2♀, 10.x–9.xi.2005, LT, AvH. SE of ad-Dhaid, 1♀, 27.xi–1.xii.2005, WT, AvH.

Distribution: Palaearctic: UAE.

***Tethina incisuralis* (Macquart, 1851)**

Specimens examined: Desert Farm, 25°08'N, 55°45'E, 1♀, 12.iii.2008, leg. J.-H. Stuke. S of Ra's al-Khaimah, coast, 2♂, 11.iii.2008, leg. J.-H. Stuke. Um al-Quwain, salt marsh, 2♂, 7♀, 18.iii.2008, leg. J.-H. Stuke,

Remarks: The records of this species from the UAE confirm definitively the occurrence of this species also in the eastern territories of the Arabian Peninsula.

Distribution: Afrotropical: Yemen. Palaearctic: Algeria, Canary Islands, Egypt, England, Greece, Israel, ?Italy, Jordan, Malta, Morocco, Qatar, Spain, Syria, Tunisia, Turkmenistan. New to the UAE.

***Tethina pallipes* (Loew, 1865)**

Specimens examined: Al-Ajban, 1♂, 9.xi–7.xii.2005, LT, AvH; 3♂, 1.iv–2.v.2006, MT, AvH. 7 km S of al-Jazirat al-Hamra, 1♀, 27.ii.2006, leg. J.C. Deeming. Sharjah, 1♂, 1♀, 12–28.vi.2005, LT, AvH. Um al-Quwayn, 'park' at the beach, 1♂, 18.iii.2008, leg. J.-H. Stuke.

Distribution: Afrotropical: Cape Verde Islands, Senegal, Seychelles (Aldabra), South Africa. Australasian/Oceanian: Australia. Oriental: Taiwan. Nearctic: Bermuda, USA. Neotropical: Chile, Mexico. Palaearctic: Algeria, Azores, Bulgaria, Canary Islands, Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Madeira, Malta, Oman, Spain (including Balearic Islands), Tunisia, Turkey, UAE.

***Tethina pleuralis* Munari nov. spec.**

Plates 1–2, Figures 1–2

Specimens examined: Holotype: ♂, [printed white label] "United Arabian [sic] Emirates, / S Ras Al Khaimah, coast / (25° 43,66' N, 055° 52,42' E) / 11.03.2008, Stuke leg. / 1237 [in bold, printed vertically] // [printed red label] HOLOTYPE / *Tethina pleuralis* / sp. nov. ♂ / L. Munari des.". The specimen is in excellent condition, and is double mounted (micropinned in a block of plastic material); abdomen dissected, stored in glycerol in a small plastic tube, and pinned below the specimen. The holotype is deposited in the NMWC. Paratypes: 2♂, 5♀, Um al-Quwayn, beach, 18.iii.2008, leg. J.-H. Stuke.

Diagnosis: This species is distinguished from congeners of the *alboguttata*-group by the following combination of characters: setal vestiture depigmented, white to pale yellow; head entirely pale yellow to whitish; 3 pairs of minute, inclinate, interfrontal setae; antenna yellow, bearing arista darkened on apical half; eye strongly oblique, its longest diameter 1.56–2.36 times as long as genal height; gena whitish, with broad, longitudinal, subshiny stripe; proboscis with labella about as long as or slightly longer than buccal cavity; thorax grey, with pale yellow postpronotal lobe and pleura with large stripes and irregular spots of the same colour as postpronotal lobe; acrostichal setulae long, arranged in 4 rows; acrostichal



Plate 1. *Tethina pleuralis* Munari nov. spec., female. (Photograph © James Turner / NMWC)

prescutellars fairly long; Intra-alars and the two accompanying rows of mesonotal setulae irregular; third posterior of scutum strongly setulose; scutellum with very wide, brown spot with indefinite outline (Plate 2); legs entirely pale yellow, only apical tarsomere strongly infuscate; wing weakly infuscate on entire anterior half; black macula on dorsal basis of vein R_1 ; crossveins depigmented, with no milky halo surrounding them; syntergite 1+2 broadly yellowish; male terminalia with surstylos subtriangular, tapered apically in lateral view (Fig. 1), bearing wide, ventral lobe in caudal view (Fig. 2), with several setae on inner side.
Description: Size. Body length 1.45–2.73 mm, wing length 1.68–2.31 mm. Habitus. Small fly with body mainly grey, pale yellow striped pleura, and yellowish legs. Scutellum with dark



Plate 2. *Tethina pleuralis* Munari nov. spec., female. (Photograph © James Turner / NMWC)

spot. Setal vestiture depigmented, white to pale yellow. Wings weakly infuscate on entire anterior half.

Head. Entirely pale yellow to whitish; postocellar setae short, strongly inclinate, hardly discernible; medial vertical seta inwardly curved, strong, about as long as lateral seta; paravertical seta markedly inclinate toward vertex; postocular setae arranged in single row; ocellar triangle bearing a pair of long, strong, ocellar setae; 3–4 (sometimes 2–3 anterior setae present as well) short, orbital setae; 3 pairs of minute, inclinate, interfrontal setae; antenna yellow, bearing microscopically pubescent arista being darkened on its apical half; eye glabrous, strongly oblique, its longest diameter 1.56 (♀)–2.36 (♂) times as long as genal height; gena whitish, marked by broad, longitudinal, subshiny stripe; 5–6 weak, depigmented, peristomal setae; mouth parts pale yellowish, with long, slender palpus, labella about as long as or slightly longer than buccal cavity length.

Thorax. Grey microtomentose, with pale yellow postpronotal lobe strongly contrasting with rest of mesonotum; pleura with large stripes and irregular spots of the same colour as postpronotal lobe; anterior half of scutum marked by 2 faint, longitudinal, brown, close-set stripes; 1+3 dorsocentral setae; acrostichal setulae long, arranged in 4 rows, median rows with longer setulae; acrostichal prescutellars fairly long; 3 postpronotal setae, each with different orientation, intermixed with short setulae; 1 presutural; 2 notopleurals, anterior seta slightly longer; 1 supra-alar; 2 postalars, external seta distinctly longer; Intra-alars and the two



Figures 1–2. *Tethina pleuralis* Munari nov. spec., male. 1: Terminalia, lateral view; 2: Terminalia, caudal view. Scale bar = 0.1 mm.

accompanying rows of mesonotal setulae irregular; scutellum with usual two pairs of long setae, bearing very wide, brown spot with strongly indefinite outline (Plate 2); 1 proepisternal; 1 proepimeral; anepisternum sparsely setulose, bearing 3 posterior and 1 posterodorsal long, marginal setae; katepisternum with long, erect, posterodorsal seta; anepimeron, katatergite, and meron without setae and setulae.

Legs. Entirely pale yellow, including coxae and trochanters, only apical tarsomere strongly infuscate, blackish; evenly setulose, bearing short setae and setulae, except for forefemur bearing antero-dorsal and postero-ventral rows of fairly long, spaced setae.

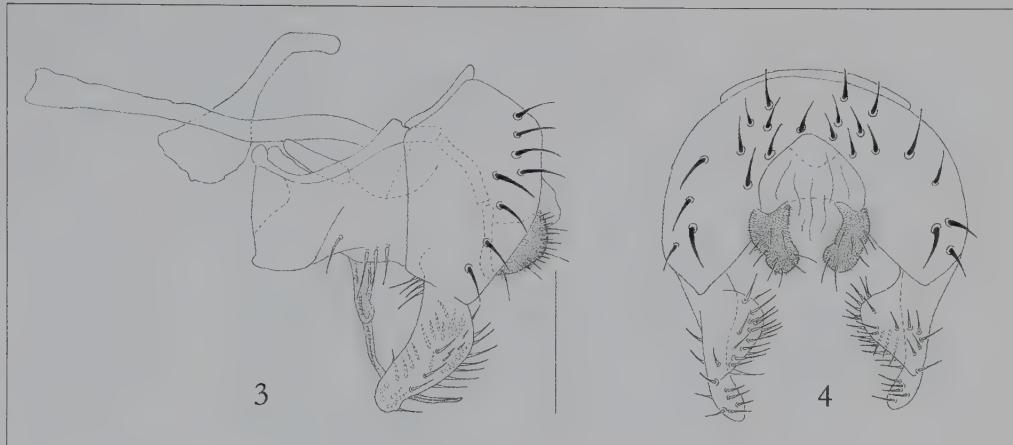
Wing. Weakly infuscate on entire anterior half; black macula on dorsal basis of vein R_1 ; veins brown, particularly on distal half, except for crossveins being white (depigmented), with no milky halo surrounding them; alula with fringe formed by several, long, depigmented setae; costal vein reaching end of M_1 ; R_{2+3} and R_{4+5} slightly divergent distally; R_{4+5} and M_1 parallel on distal half; crossvein $r-m$ ending approximately at middle of cell dm ; crossvein $dm-cu$ as long as or slightly shorter than half of last section of CuA_1 ; haltere pale yellow to whitish.

Abdomen. Syntergite 1+2 broadly yellowish, other tergites brown with more or less wide, yellowish margins, in a few specimens postabdominal tergites almost entirely yellowish, each tergite bordered by transverse, apical, white stripe; setal vestiture formed by several, tiny, weak setae and setulae.

Male terminalia (Figs 1–2). Epandrium bearing long setae on the caudal area; surstyli subtriangular, tapered apically in lateral view, bearing wide, ventral lobe in caudal view, with several setae on inner side; cercus short, stumpy, microscopically pubescent, bearing a few long, thin setae; phallapodeme long and straight; ejaculatory apodeme of usual shape; distiphallus setulose, ribbon-like.

Female. Similar to male except for usual, slight, sexual dimorphism. Postabdomen scarcely telescopically retractile, with short, stumpy cerci, each bearing several thickset spinulae.

Remarks: This new species, belonging to the *alboguttata*-group, is closely related to *Tethina dunae* Munari, 2007. It differs mainly in having broader, roundish, scutellar spot, with noticeably vague outline (clearly subrectangular to subtrapezoidal, with well defined outline, in *T. dunae*), and surstyli sharply subtriangular (in lateral view), noticeably long,



Figures 3–4. *Tethina stukei* Munari nov. spec., male. 3: Terminalia, lateral view; 4: Terminalia, caudal view. Scale bar = 0.1 mm.

narrow, and tapered apically, rather than regularly lobe-shaped as in *T. dunae* (see Munari, 2007, fig. 1). On the other hand, the external terminalia of male are identical, caudally, to those of *T. dunae*. The characteristic yellow pattern of pleura and postpronotal lobe (yellow striped pleura and yellow postpronotal lobe, the latter strongly contrasting with the rest of greyish scutum) are also quite similar in the two species. Unfortunately, Munari (2007) overlooked this peculiar character in the description of *T. dunae*. In this connection, it should be said this character state is clearly visible only by using a shadow-free lighting, i.e. a circular fluorescent vision illuminator rather than the customary fiber optical illuminator.

Despite the overall, strong similarity between these two species, the differences above-mentioned represent, in my opinion, significantly consistent characters rather than being due to mere intraspecific or geographic variation. It is also true these two taxa should be regarded as two cryptic species, rather easily recognizable, though, on the basis of both chromatic pattern of the scutellum and morphology of the surstyli in lateral view.

Distribution: UAE.

Etymology: The species epithet, *pleuralis*, is a Latin adjective meaning ‘relating to pleura’, and refers to the peculiar, yellow striped pattern of the pleura.

Tethina spinigera Munari, 2008

Specimens examined: Al-Ajban, 4♂, 6♀, 23–30.xi.2005, MT, AvH.

Distribution: Palaearctic: UAE.

Tethina stukei Munari nov. spec.

Specimens examined: Holotype: ♂, [printed white label] “United Arabian [sic] Emirates, / Umm al Qaywayn, beach / (25° 31,46' N, 055° 31,53' E) / 18.03.2008, Stuke leg. / 1253 [in bold, printed vertically] // [printed red label] HOLOTYPE / *Tethina stukei* / sp. nov. ♂ / L. Munari des.”. The specimen is in excellent condition, and is double mounted (micropinned in a block of plastic material); abdomen dissected, stored in glycerol in a small plastic tube, and pinned below the specimen. Holotype deposited in NMWC. Paratypes: 2♂, 6♀, same data as holotype. 3♂, 8♀, N of Ajman, coast, 11.iii.2008, leg. J.-H. Stuke. 2♀, N of Ajman, dunes with mangrove *Avicennia marina*, 11.iii.2008, leg. J.-H. Stuke. 1♂, 1♀, S of Ra’s al-Khaymah, coast, 11.iii.2008, leg. J.-H. Stuke.

Plates 3–4, Figures 3–4



Plate 3. *Tethina stukei* Munari nov. spec., female. (Photograph © James Turner / NMWC)

Diagnosis: This species is distinguished from congeners of the *alboguttata*-group by the following combination of characters: setal vestiture of head and thorax mostly dark brown (particularly in male); head with vertex and occiput grey; 4 pairs of interfrontal setae; antenna yellow, bearing arista darkened on apical half; eye oblique, elliptic, its longest diameter 1.75–2.87 times as long as genal height; gena whitish, with broad, longitudinal, subshiny stripe; proboscis with labella distinctly shorter than buccal cavity; thorax uniformly grey; acrostichal setulae very scarce, poorly developed, often arranged in a single row; acrostichal prescutellars lacking; intra-alar setulae scarce; posterior third of scutum generally without setulae; scutellar spot black, with well definite outline (Plate 4); legs entirely pale yellow, only apical tarsomere strongly infuscate; wing weakly infuscate on entire anterior half; black macula on dorsal basis of vein R_1 ; crossveins depigmented, with no milky halo surrounding them; syntergite 1+2 broadly yellowish; male terminalia with surstyli distinctly sinuous in lateral



Plate 4. *Tethina stukei* Munari nov. spec., female. (Photograph © James Turner / NMWC)

view (Fig. 3), bearing wide, ventral lobe (Fig. 4); distal portion of surstyli lobe-shaped in caudal view (Fig. 4).

Description: Similar to *T. pleuralis* nov. spec., agreeing with description of that species, except as indicated below.

Size. Body length 1.61–3.78 mm, wing length 1.49–2.33 mm. Habitus: small fly with bicoloured head (grey-whitish yellow) and abdomen (yellow-brown), and thorax grey. Setal vestiture of head and thorax mostly dark brown (particularly in male).

Head. Vertex and occiput dark, covered with grey microtomentum; 4 pairs of interfrontal setae; eye oblique, elliptic, its longest diameter 1.75 (♀)–2.87 (♂) times as long as genal height; proboscis with labella distinctly shorter than buccal cavity length.

Thorax. Pleura and postpronotal lobe uniformly grey, former without yellow stripes and spots; anterior half of scutum marked by 2 evident, longitudinal, brown, close-set stripes; acrostichal setulae very scarce, poorly developed, often arranged in a single row, sometimes only 2–3 tiny setulae visible on anterior half of scutum, acrostichal prescutellars lacking; intra-alar setulae scarce, sparsely distributed on the anterior half of scutum; third posterior of scutum generally without setulae, only main setae present; scutellar spot black, with well definite outline (Plate 4).

Male terminalia (Figs 3–4). Surstyli distinctly sinuous in lateral view, bearing wide, ventral lobe; distal portion of surstyli lobe-shaped in caudal view, with several setae on inner side; cercus particularly small, showing a slight swelling apically (caudal view); phallapodeme long, with sinuous proximal half and straight distal half.

Distribution: UAE.

Etymology. The species epithet, *stukei*, is a genitive patronym to honour the German colleague Dr. Jens-Hermann Stuke, who collected the type series.

Subfamily **Zaleinae** D.K. McAlpine, 1985

[*Suffomyia dancei* Munari, 2008]

Specimens examined (previously published): OMAN: Muscat, Haramel, 8♂, 4♀ [type series], 4, 14, 21, 23–25, 28.iii.1995, leg. S.P. Dance,

Remarks: This species is closely related to *S. scutellaris* Freidberg. It differs from the latter species mainly by the shape of the male terminalia and the peculiar, bilobate structure of the female tergite 7 (Munari, 2008b).

Distribution: Palaearctic: Oman.

[*Suffomyia scutellaris* Freidberg, 1995]

Specimens examined: OMAN: Muscat, Haramel, in garden within 3 m of sea wall in small harbour, 1♂, 13.iii.1995, leg. S.P. Dance,

Remarks: In the framework of a paper on the Canacidae from the Arabian Peninsula, Munari (2008b) recorded informally this species from Oman. The record is now confirmed and formalized in the present work.

Distribution: Palaearctic: Egypt (Sinai), Israel, Oman.

CONCLUSIONS

From a zoogeographical point of view, the eastern territories of the Arabian Peninsula (Qatar, UAE, Oman) seem to be a true crossroad for various species of Canacids otherwise typical of other adjacent, huge areas, such as the Mediterranean subregion, the Afrotropical Region, and the immense Indo-Pacific area. In fact, the zoogeographic affinities (Fig. 5) are mostly towards the northwest (A), and specifically with the southern Mediterranean subregion (species of the *Tethina alboguttata*-group, *Suffomyia* species, *Xanthocanace sabroskyi* and *X.*



Figure 5. Zoogeographical affinities of the Canacidae from the eastern Arabian Peninsula (Qatar, UAE and Oman) (see text for further explanations). (Original, unprocessed map: Microsoft® Encarta®, © 1993 – 2002 Microsoft Corporation)

kaplanorum); towards the south (B), with the eastern and southern littorals of the Afrotropical Region (species belonging to the Afrotropical genera *Horaismoptera* and *Afrotethina*); towards the east and the southeast (C), with the huge Indo-Pacific territories of the Oriental Region (*Xanthocanace hamifer*, *Nocticanace affinis*, *Dasyrhicnoessa* species), the latter area with species also spread in the remote Australasian/Oceanian Region. Therefore, the eastern Arabian countries constitute for the Canacidae a factual, transitional zone between the faunae of three main zoogeographic regions, with elements which are characteristic of each of these regions.

It is noteworthy to underline a peculiar character observed in the species of *Tethina* of the *alboguttata*-group, that is the characteristic black macula clearly visible on the basis of the vein R₁ of the wing. Except for *T. spinigera* and *T. callosirostris*, all the other species belonging to this group show this peculiarity that is, on the contrary, lacking in the other species of the group. On the other hand, *T. spinigera*, which has no black macula on R₁, exhibits such a peculiar chaetotaxy of the epandrium, formed by short, stout spinulae rather than long setae, that allows its placement as a possible sister species of the remaining Arabian *Tethina* species of the *alboguttata*-group. *T. callosirostris* shows instead, on the basis of the vein R₁, a simple, transverse, fine, black line like that of some Mediterranean species. The unique occurrence of the black macula above-mentioned (an apomorphic character state) only in the species from the eastern Arabian Peninsula, would indicate it to be a common centre of speciation.

Table 1. Distribution of the Canacidae species in the eastern part of the Arabian Peninsula.

Genera and species of Canacidae	Qatar	UAE	Oman
<i>Nocticanace affinis</i> Munari, 2008		•	•
<i>Xanthocanace hamifer</i> Munari, 2008		•	
<i>Xanthocanace kaplanorum</i> Mathis & Freidberg, 1982			•
<i>Xanthocanace sabroskyi</i> Mathis & Freidberg, 1982		•	•
<i>Xanthocanace zeylanica</i> Delfinado, 1975			•
<i>Horaismoptera vulpina</i> Hendel, 1907	•	•	•
<i>Afrotethina martinezii</i> Munari, 2005	•	•	•
<i>Dasyrhicnoessa ferruginea</i> (Lamb, 1914)		•	•
<i>Dasyrhicnoessa fulva</i> (Hendel, 1913)		•	•
<i>Dasyrhicnoessa tripunctata</i> Sasakawa, 1974 (cf.)		•	
<i>Tethina callosirostris</i> Munari, 2008		•	
<i>Tethina dunae</i> Munari, 2007			•
<i>Tethina incisuralis</i> (Macquart, 1851)	•	•	
<i>Tethina longilabella</i> Munari, 2007			•
<i>Tethina omanensis</i> Munari, 2007			•
<i>Tethina pallipes</i> (Loew, 1865)		•	•
<i>Tethina pleuralis</i> Munari nov. spec.		•	
<i>Tethina shalom</i> Freidberg & Beschovski, 1996 (doubtful)	•		
<i>Tethina soikai</i> Munari, 1981			•
<i>Tethina spinigera</i> Munari, 2008		•	
<i>Tethina strobliana</i> (Mercier, 1923)			•
<i>Tethina stukei</i> Munari nov. spec.		•	
<i>Suffomyia dancei</i> Munari, 2008			•
<i>Suffomyia scutellaris</i> Freidberg, 1995			•

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Order Diptera, family Drosophilidae

Vasily S. Sidorenko and Olga V. Nakonechnaya

INTRODUCTION

The Drosophilidae is a large cosmopolitan family of acalyprate flies. Most of the species are saprophagous and feed on microorganisms in spoiled fruits, slime fluxes, fungi or other decaying organic matter. Some occur in flowing tree sap or in flowers. Many species of the genus *Scaptomyza* are leaf miners. Some species have bizarre feeding habits (Ashburner, 1981), being predators of Aleurodidae, Aphidoidea, certain other Homoptera or inquilines of solitary bees nests. The family includes the model organism *Drosophila melanogaster* Meigen, 1830, which has been studied intensively by geneticists, molecular and developmental biologists, and others.

The Palaearctic fauna currently comprises 482 species of 27 genera (Brake & Bächli, 2008). The drosophilid fauna of the Middle East, excluding Turkey, Israel and Lebanon (Máca, 1987, 1999; Bächli et al., 2002; Bächli, 2009), is poorly known. Hackman (1970) recorded some species from Afghanistan. The fauna of the Arabian Peninsula, apart from the few records listed from Saudi Arabia, Yemen and Oman (Bächli, 2009), is completely unknown. The family has hitherto not been reported from the UAE. This study enumerates 13 species in 7 genera, one of them new to science.

Nomenclature and systematic arrangement follow the World Catalogue of Drosophilidae (Brake & Bächli, 2008) and the TaxoDros database, version of October 2009 (Bächli, 2009).

MATERIALS AND METHODS

Most of the specimens dealt with in this chapter were collected by Mr. A. van Harten, using Malaise, water and light traps, and preserved in alcohol. Unless otherwise stated, the specimens were collected by him. More than 600 specimens were examined. The holotype and some paratypes of the new species are deposited in the National Museum of Wales, Cardiff, UK (NMWC). The remaining material is divided between the United Arab Emirates Invertebrate Collection, the collection of Environment Abu Dhabi, UAE, and the private collection of V. Sidorenko (Russia).

We followed Zhang & Toda (1992) and Bächli et al. (2004) for the definitions of measurements and indices: ac = third costal section between R₂₊₃ and R₄₊₅/distance between distal ends of R₄₊₅ and M₁; C = second costal section between subcostal break and R₂₊₃/third costal section between R₂₊₃ and R₄₊₅; dcl = anterior dorsocentral/posterior dorsocentral in length; dcp = length distance between ipsilateral dorsocentrals/cross distance between anterior dorsocentrals; hb = length of heavy setation in third costal section between R₂₊₃ and R₄₊₅/ third costal section between R₂₊₃ and R₄₊₅; M = CuA₁ between dm-cu and wing margin/M₁ between r-m and dm-cu; orbito = distance between proclinate and posterior reclinate orbitals/distance between inner vertical and posterior reclinate orbital; presctl = prescutellar/posterior dorsocentral in length; prorb = proclinate orbital/posterior reclinate orbital in length; rcorb = anterior reclinate orbital/posterior reclinate orbital in length; sctl = basal scutellar/apical scutellar in length; sctlp = distance between ipsilateral scutellars/cross distance between apical scutellars; sterno = anterior katepisternal/posterior katepisternal in length; 4C = third costal section between R₂₊₃ and R₄₊₅/M₁ between r-m and dm-cu; 4v = M₁ between dm-cu and wing margin/M₁ between r-m and dm-cu; 5x =

CuA1 between dm-cu and wing margin/dm-cu between M1 and CuA1. Other abbreviations used throughout the text: NARC = National Avian Research Centre; LT = light trap; MT = Malaise trap; WT = water trap.

SYSTEMATIC ACCOUNT

Subfamily Steganinae Hendel, 1917

Cacoxenus (Gitonides) vanharteni Sidorenko nov. spec. Plates 1–4, Figures 1–2

Specimens examined: Holotype: ♂, United Arab Emirates, Sharjah Desert Park, 25°17'N 55°42'E, 20.x–24.xi.2007, in light trap, leg. A. van Harten. Paratypes: 15♂, 3♀, same data as holotype. 1♂, Fujairah, 1–8.iv.2006, LT; 1♂, 15–22.iv.2006, LT. 1♂, Hatta, 4–11.iv.2006, LT; 2♂, 1♀, 8–26.iv.2006, LT.

Description: Male. Body length 2.7 (2.0–3.3) mm. Head width 1.1 (0.8–1.2) mm. Frons yellowish-brown, dull, with numerous interfrontal setulae. Frontal index 1.0 (0.8–1.1); frontal tapering ratio 1.0 (0.9–1.1). Frontal triangle unclear; ocellar triangle prominent, dark-brown. Orbital plates narrow, yellowish-brown. Orbital setae dark-yellow, virtually in row; prorb 1.1 (1.0–1.3); rcorb 0.85 (0.7–1.1); orbito 1.3 (1.1–1.6); vibrissal index 0.3. Minute setae present between orbital setae. Vibrissa situated on dark-brown band. Face yellowish-brown, dull. Carina flat, slightly prominent. Cheeks with dark-brown oval spot near lower margin of eye. Cheek index 4.9 (3.8–7.0). Eye red, bare; index 1.45 (1.3–1.6). Antennae yellowish-brown. Pedicel yellowish-brown. Flagellomere I length to width ratio 1.9 (1.6–2.1). Arista bare. Proboscis yellow. Palpus yellow, broad, swollen, with sparse short setae ventrally, apical seta slightly longer and stronger than others.

Thorax length 1.2 (0.8–1.5) mm. Scutum yellowish-brown, without spots at bases of setae. About 20 irregular rows of acrostichal setae. Only 1 postpronotal seta. Del 0.35 (0.3–0.5); dcp 0.2 (0.17–0.25); presctl 0.5 (0.45–0.55). Scutellum yellowish-brown., with 1–2 short setae in front of basal and apical scutellar setae respectively. Apical scutellar setae crossed, basal scutellar divergent; sctl 1.05 (0.9–1.3); sctlp 0.6 (0.44–0.9). Pleura yellowish-brown; sterno index 0.85 (0.75–0.9). Haltere yellowish-brown. Legs yellow. Preapical and apical setae on all tibiae but mid apical seta spur-like.

Wing transparent. Wing length 2.0 (1.4–2.6) mm; wing width 1.0 (0.8–1.4) mm. Indices: C 1.9 (1.8–2.25); ac 1.9 (1.7–2.2); hb 0.6 (0.5–0.8); 4C 1.2 (1.15–1.7); 4v 2.6 (2.15–2.9); 5x 1.9 (1.5–2.2); M 1.0. (0.8–1.4).

Abdomen brownish-black. Tergites I and II yellowish-brown medially, others dark-brown posterad. Sternites dark-brown: IV rounded, with 4 long setae caudally; V with 8 setae, excavated anteriorly; VI deeply notched, almost separated into two parts; VII narrow, semicircular, sclerotized, with short strongly chitinized spurs.

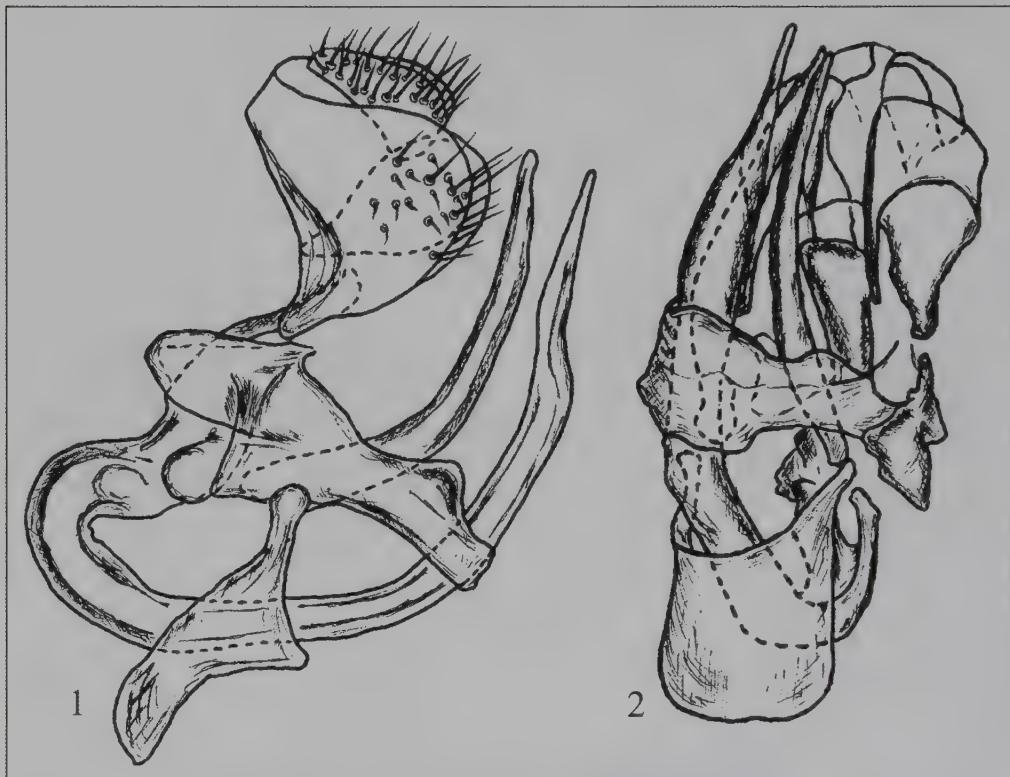
Epandrium with about 25 setae near postero-caudal and along ventral margins; anterior ventral corner strongly protruding. Surstyli separated from and covered by epandrium, rounded apically, with short setulae, without chitinized teeth. Cerci separated from epandrium, setigerous (Fig. 1). Hypandrium reduced, plate-like, lacking pubescence and paramedian setae. Parameres sclerotized, sabre-like, basally articulated with aedeagal apodeme, without sensilla. Gonopods anteriorly not fused to aedeagus, plate-like, vertical lobe slightly sclerotized. Aedeagal apodeme lobe-like, horizontally flattened, with pair of arms fused to base of parameres. Aedeagus sclerotized, strongly curved, narrowed apically in lateral view (Fig. 2).

Female. Body length 3.0 (2.9–3.3) mm. Head width 1.15 (0.95–1.3) mm. Frontal index 1.05. (0.9–1.15); frontal tapering ratio 1.0 (0.95–1.1). Prorb 1.15 (1.0–1.5); rcorb 0.8 (0.6–0.9); orbito 1.4 (1.2–1.6); vibrissal index 0.33 (0.3–0.38). Cheek index 4.9 (4.3–6.4); eye index 1.55.



Plates 1–4. *Cacoxenus (Gitonides) vanharteni* Sidorenko nov. spec., 1–2: Habitus of male, lateral view; 3–4: Habitus of female, lateral view.

(1.35–1.65). Flagellomere I length to width ratio 2.0 (2.0–2.1). Palpus with prominent apical and 3–4 ventral setae. Thorax length 1.4 (1.2–1.6) mm. Dcl 0.4 (0.38–0.45); dcp 0.2 (0.19–0.25); sclt 0.9 (0.9–1.1); presclt 0.6 (0.55–0.6); sctlp 0.65 (0.5–0.8); sterno 0.95. (0.8–1.1). Wing length 2.3 (1.8–2.8) mm; wing width 1.1 (0.9–1.35) mm. Indices: C 2.7 (2.0–3.45); ac 1.5 (1.3–1.6); hb 0.4 (0.3–0.6); 4C 1.25 (1.1–1.4); 4v 2.7 (2.4–3.3); 5x 1.8 (1.6–2.1); M 1.1 (0.85–1.25).



Figures 1–2. *Cacoxenus (Gitonides) vanharteni* Sidorenko nov. spec., male genitalia. 1: Lateral view; 2: Ventral view.

Tergites I–II yellow; tergites III–V with broad brownish-black bands interrupted medially; VI with small caudal spots separated medially; VII brownish-black. Sternites yellowish-brown

Remarks: New species belongs to the subgenus *Gitonides* Knab, 1914, according to a comparative table given by Tsacas & Desmier de Chenon (1976). *Cacoxenus (Gitonides) vanharteni* nov. spec. is very similar to the Palaearctic *C. (G.) vlasovi* (Duda, 1935) in general appearance, but can be distinguished from the latter in palpus, surstylus, parameres and aedeagus (in *vlasovi* palpus normal, with prominent setae; surstylus narrowed apically, with 2–4 strongly chitinized teeth; parameres broadened basally, with about 10 sensilla arranged longitudinally; aedeagus not so strongly curved, truncated apically in lateral view).

Distribution: UAE.

Cacoxenus (Gitonides) odontophorus Tsacas & Chassagnard, 1999

Specimens examined: Fujairah, 1♂, 20–27.v.2005, LT.

Plate 5

Remarks: Biology is unknown.

Distribution: Yemen and Nigeria. New to the UAE.

Gitona beckeri Duda, 1924

Plate 6

Specimens examined: Al-Ajban, 1♀, 7–28.xii.2007, LT & MT. Sharjah Desert Park, 1♀, 21.xi–22.xii.2007, LT.



Plates 5–8. 5: *Cacoxenus (Gitonides) odontophorus* Tsacas & Chassagnard, habitus of male; 6: *Gitona beckeri* Duda, habitus of female; 7–8: *Gitona canariensis* (Duda). 7: Habitus of female; 8: Habitus of male.

Remarks: Among the 15 species of the genus *Gitona* Meigen, 1830, only *G. beckeri* and *G. incohata* Bock, 1982, have a short rudimentary vein near the apex of R₂₊₃. Examined specimens also have this rudimentary vein (Plate 6) and key out to *G. beckeri* in Máca (1988). Biology is unknown.

Distribution: Uzbekistan, China, and Cyprus. New to the UAE.

Gitona canariensis Duda, 1934

Specimens examined: Fujairah, 1♀, 1–8.iv.2006, WT. Hatta, 4♂, 1♀, 4–11.iv.2006, LT; 4♂, 7♀, 8–26.iv.2006, LT. Wadi Bih dam, 2♀, 24.iv–1.v.2007, LT. Wadi Safad, 1♂, 15–22.iv.2006, 1♀, LT.

Remarks: This species was only known from Gran Canaria. The specimens examined possess spotless wings and three indistinct stripes on the male thorax (female thorax without such stripes). Male genitalia are indistinguishable from those figured by Tsacas (1995).

Distribution: Canary Islands. New to the UAE.

Plates 7–8

Subfamily *Drosophilinae* Rondani, 1856

Scaptodrosophila lebanonensis (Wheeler, 1949)

Plates 9–10

Specimens examined: Bithnah, 22♂, 9♀, 16.xi–26.xii.2006, MT. Hatta, 1♂, 1♀, 8–26.iv.2006, LT.

Remarks: The flies are attracted by fruit and fermented drinks.

Distribution: Mediterranean area, Canary Islands, Hungary, Romania, Ukraine, Caucasus, Tajikistan, Iran, S China, USA (Arizona), Bahamas, and Brazil.



Plates 9–12. 9–10: *Scaptodrosophila lebanonensis*, habitus of male; 11–12: *Chymomyza pararufithorax* Vaidya & Godbole, habitus of female.

***Chymomyza pararufithorax* Vaidya & Godbole, 1973**

Specimens examined: Al-Ajban, 1♀, 27.xii.2006–18.ii.2007, MT; 1♀, 7–28.xii.2007, LT & MT.

Remarks: Examined specimens keyed out to *Ch. pararufithorax* in Okada (1976). Biology is unknown.

Distribution: Japan (Ryukyu Islands), S China, Hainan Island, Malaysia, Myanmar, India, and Sri Lanka. New to the UAE.

Plates 11–12

***Drosophila (Sophophora) kikkawai* Burla, 1954**

Specimens examined: Al-Ajban, 1♂, 6–22.v.2006, LT; 3♂, 2♀, 7–28.xii.2007, LT & MT. Bithnah, 1♂, 1♀, 16.xi–26.xii.2006, MT. Fujairah, 20–27.v.2005, 1♀, LT. Hatta, 1♂, 1♀, 8–26.iv.2006, LT. Khor al-Khwaire, 3♂, 15–22.iii.2007, LT. Ruwais, Housing Complex, 1♂, 18.iv.2006, LT, leg. A. Saji. Sharjah

Plates 13–14

Desert Park, 3♂, 6♀, 20.x–24.xi.2007, LT; 3♂, 5♀, 21.xi–22.xii.2007, LT. Wadi Hayl, 1♂, 28.iii.2007, sweep net, leg. F. Menzel & A. Stark.

Remarks: The flies are rather common indoors, attracted by fruit and fermented drinks. Larvae are predominantly fruit breeders.

Distribution: Circumtropical, sometimes subtropical species occurring in SE Asia, New Guinea, Australia, New Caledonia, Fiji, Samoa, Hawaii, Africa?, Mauritius, and the Neotropics. New to the UAE.

Drosophila (Sophophora) melanogaster Meigen, 1830

Plate 15

Specimens examined: Al-Ajban, 1♂, 2♀, 27.xii.2006–18.ii.2007, MT. Bithnah, 1♂, 26.xii.2006–20.ii.2007, MT. Wadi Bih, 1♂, 22.iii.2007, sweep net, leg. F. Menzel & A. Stark.

Remarks: Domestic species recorded almost everywhere. The flies are common indoors, attracted by fruit and fermented drinks. Larvae are predominantly fruit breeders.

Distribution: Cosmopolitan species. In the Middle East it has been recorded from Iraq, Syria, Lebanon, the north of the Arabian Peninsula, and Yemen. New to the UAE.

Drosophila (Sophophora) simulans Sturtevant, 1919

Plate 16

Specimens examined: Hatta, 21♂, 8♀, 4–11.iv.2006, LT; 12♂, 9♀, 8–26.iv.2006, LT. Sharjah Desert Park, 1♂, 3♀, 21.xii–22.xii.2007, LT. Wadi Bih dam, 1♀, 24.iv–1.v.2007, LT. Wadi Safad, 8♂, 5♀, 15–22.iv.2006, LT.

Remarks: Domestic species, less widely distributed than *D. melanogaster*; absent in cold areas. The flies are common indoors, attracted by fruit and fermented drinks. Larvae are predominantly fruit breeders.

Distribution: Cosmopolitan species. In the Middle East it has been recorded from Iraq, Syria, and Lebanon. New to the UAE.

Scaptomyza (Scaptomyza) flava (Fallén, 1823)

Plates 17–18

Specimens examined: Hatta, 1♂, 1♀, 4–11.iv.2006, LT; 1♀, 8–26.iv.2006, LT.

Remarks: Leaf-mining larvae of this species have been found in various plants, particularly Brassicaceae.

Distribution: Holarctic species widespread in Europe (Norway to Austria). Recorded in the Canary Islands, Madeira, Azores, Turkey, Turkmenistan, Uzbekistan, Kazakhstan, Afghanistan, north-west China, Russia (European, West and East Siberia, Far East), Mongolia, and Japan. In the Middle East it has been recorded from Lebanon and Israel. New to the UAE.

Scaptomyza (Parascaptomyza) adusta (Loew, 1862)

Plate 21

Specimens examined: Hatta, 2♂, 1♀, 4–11.iv.2006, LT; 3♀, 8–26.iv.2006, LT. Wadi Shawkah, 26.iii.2007, 1♂, sweep net, leg. F. Menzel & A. Stark.

Remarks: Saprophagous species feeding and breeding on decaying plant parts of *Costus arabicus*, *Morus* spec., *Spinacea oleracea*, and other plants (Malloch, 1915; Nicoli Aldini & Bavieria, 2004; Bächli et al., 2004; Chandler et al., 2008).

Distribution: USA, Mexico to Argentina, Great Britain, Canary Islands, Azores, Italy, Malta, Greece, Turkey, Israel. New to the UAE.

Scaptomyza (Parascaptomyza) pallida (Zetterstedt, 1847)

Plates 19–20

Specimens examined: Al-Ajban, 1♂, 2♀, 26.iii–4.iv.2006, MT; 7♂, 8♀, 6–22.v.2006, LT; 6♂, 8♀, 7–28.vii.2007, LT & MT. Bithnah, 3♂, 3♀, 26.xii.2006–20.ii.2007, MT. Fujairah, 1♀, 20–27.v.2005, LT; 3♀, 1–8.iv.2006, LT, 2♀, 15–22.iv.2006, LT. Hatta, 26♂, 40♀, 4–11.iv.2006, LT; 26♂, 32♀, 8–26.iv.2006, LT. Khor al-Khwaire, 2♂, 2♀, 24.iv–1.v.2005, LT; 5♀, 24.iv–1.v.2007, LT. Sharjah Desert



Plates 13–16. 13–14. *Drosophila (Sophophora) kikkawai* Burla. 13: Habitus of female; 14: Habitus of male; 15: *D. (S.) melanogaster* Meigen, habitus of female; 16: *D. (S.) simulans* Sturtevant, habitus of female.

Park, 2♂, 3♀, 23–30.iv.2007, LT; 9♂, 10♀, 20.x–24.xi.2007, LT; 9♂, 13♀, 21.ix–22.xii.2007, LT. NARC, near Sweihan, 1♀, 26.ii.–2.iv.2004, LT. Wadi Bih dam, 1♀, 22.iii.2007, sweep net, leg. F. Menzel & A. Stark; 33♂, 40♀, 24.iv–1.v.2007, LT. Wadi Safad, 5♂, 7♀, 15–22.iv.2006, LT. Wadi



17



18



19



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Plates 17–20. 17–18. *Scaptomyza (Scaptomyza) flava* (Fallén). 17: Habitus of female; 18: Habitus of male. 19–20: *Scaptomyza (Parascaptomyza) pallida* (Zetterstedt). 19: Habitus of female; 20: Habitus of male.

Shawkah, 3♂, 2♀, 26.iii.2007, sweep net, leg. F. Menzel & A. Stark. Al-Wathba, 1♀, 28.x.2004, WT, leg. A. Saji.

Remarks: The larvae of this species of *Scaptomyza* are common in decaying plant material. Detailed information on its biology is given by Máca (1972). Adults are very abundant among grasses.

Distribution: Possibly cosmopolitan species. In the Middle East it has been recorded from Syria, Lebanon, Israel, and Yemen. New to the UAE.

***Zaprionus indianus* Gupta, 1970**

Plate 22

Specimens examined: Al-Ajban, 1♂, 2♀, 26.iii–4.iv.2006, MT; 2♂, 4♀, 27.xii.2006–18.ii.2007, MT. Bithnah, 4♂, 8♀, 16.xi–26.xii.2006, MT. Fujairah, 2♂, 20–27.v.2005; 1♂, 15–22.iv.2006, LT. Hatta, 1♂, 1♀, 4–11.iv.2006, LT. Jebel Dhanna, 1♀, 22.xii.2004, LT leg. A. Saji. Khor al-Khwair, 1♀, 24.iv–1.v.2005, LT. Ruwais, housing complex, 1♀, 18.iv.2006, LT, leg. A. Saji. Sharjah Desert Park, 1♂, 13♀, 20.x–24.xi.2007, LT; 9♂, 34♀, 21.xi–22.xii.2007, LT. Wadi Hayl, 1♂, 1♀, 28.iii.2007, sweep net, leg. F. Menzel & A. Stark. Wadi Safad, 4♂, 2♀, 15–22.iv.2006, LT.

Remarks: A highly polyphagous species known to infest at least 73 different kinds of fruits (Vilela, 1999). *Z. indianus* is the one of the most common species of the genus in the UAE. This African species previously colonized India, some tropical islands of the Indian and Atlantic oceans, Saudi Arabia, and is widely spread in Brazil, and Uruguay (Nava et al., 2007).

Distribution: Austria, Italy, India, Pakistan, Africa S of Sahara, Seychelles, Comoros, Madagascar, Mauritius, Reunion, Rodriguez Island, São Tomé, St. Helena, Cape Verde Islands, Canary Islands., Brazil, Uruguay. From the Arabian Peninsula it has been recorded from Saudi Arabia. New to the UAE.

CONCLUSIONS

Amongst the 12 species newly recorded for the UAE in this study (excluding the new species of *Cacoxenus*), four are cosmopolitan (*Drosophila melanogaster*, *D. simulans*, *Scaptomyza flava*, *S. pallida*), four are widely distributed (*Scaptodrosophila lebanonensis*, *Scaptomyza adusta*, *Drosophila kikkawai*, *Zaprionus indianus*), one (*Cacoxenus odontophorus*) is Afrotropical, one (*Chymomyza pararufithorax*) is Oriental and two (*Gitona beckeri*, *G. canariensis*) are Palaearctic. The UAE is situated at the confluence of the Palaearctic, Oriental and Afrotropical regions and its drosophilid fauna is expected to include some additional species from those regions.

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Plates 21–22. 21: *Scaptomyza (Parascaptomyza) adusta* (Loew), habitus of male; 22: *Zaprionus indianus* Gupta, habitus of female.

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Order Diptera, family Tachinidae

Theo Zeegers

INTRODUCTION

The family Tachinidae is one of the largest and most diverse families of flies (Diptera). The family is characterized within the section Calyptratae by the presence of strong hypopleural bristles and a strongly swollen postscutellum in the overwhelming majority of cases. The larvae live as endoparasitoids in Arthropoda, however, never in Isopoda, in which the related family Rhinophoridae is found (Zeegers, 2008). O’Hara (2008) gives a general review of the biology and classification of the family Tachinidae.

Virtually nothing was known of the Tachinidae of the United Arab Emirates and surrounding area. The Tachinidae of Yemen have recently been treated by Zeegers (2007). General keys to genera can be found in the handbooks by Mesnil (1944–1975) and Tschorasnig & Richter (1998) for the Palaearctic region, Crosskey (1984) for the Afrotropical region and Crosskey (1976) for the Oriental region. In this article, about 34 species of Tachinidae are recorded from the UAE, based on nearly 200 specimens; one species is new to science. Twelve of the species recorded have also been found in Yemen, including two species that were recently described from Yemen as new to science (Zeegers, 2007).

MATERIALS AND METHODS

This study is based on material recently collected by A. van Harten and others, either with malaise traps, light traps, water traps or hand netted. The localities and methods of collecting have been described by van Harten (2008). If not otherwise stated, specimens have been collected by A. van Harten.

Photographs are made through an Olympus stereo-microscope with phototube and have been processed to with Stack-software Combine-Z (Smith, 2008) to enhance focal depth.

The holotype and some paratypes of *Amnonia deemungi* nov. spec. are deposited in the Zoologisch Museum, Amsterdam (ZMA), other paratypes in the Staatliches Museum für Naturkunde, Stuttgart, Germany (SMNS), the National Museum and Galleries of Wales, Cardiff, UK, the Zoologisches Museum, Humboldt University, Berlin, Germany, the United Arab Emirates Invertebrate Collection (UAEIC) and the private collection of the author (coll. ThZ). The remaining specimens dealt with have been divided between the UAEIC and coll. ThZ. Additional specimens from the collection of the ZMA and of C. Bystrowski (Warsaw, Poland) have been studied.

The species found are listed per subfamily in alphabetical order. Abbreviations used: HC = hand collected; LT = light trap; MT = Malaise trap; WT = water trap; NARC = National Avian Research Centre.

SYSTEMATIC ACCOUNT

Subfamily Dexiinae Macquart, 1834

Cyrtophleba eremophila (Richter, 1967)

Specimens examined: Wadi Wurayah, 1♂, 12–14.iv.2005, MT.

Remarks: The closely allied *C. arabica* Zeegers, 2007, was recently described from Yemen (Zeegers, 2007).

Distribution: So far known from the steppe-region of Central Asia (Turkmenistan, Mongolia) (Herting, 1984). New to the UAE.

Subfamily Exoristinae Robineau-Desvoidy, 1830

Acemyia pyrrhocera (Villeneuve, 1922)

Specimens examined: Al-Ajban, 1♂, 1–8.iv.2006, MT.

Distribution: Mediterranean region and Central Asia. New to the UAE.

Amnonia deemangi Zeegers nov. spec.

Plates 1–3

Specimens examined: Holotype: ♂, United Arab Emirates, 7 km S of al-Jazirat al-Hamra, 25°39'N 55°45'E, 27.ii.2006, hand-collected, leg. J.C. Deeming (col. ZMA). Paratypes: 2♂, same collecting data. 1♀, al-Ajban, 1.iv–2.v.2006, MT. 1♂, N of Ajman, 11–25.xi.2006, WT; 14♂, 6♀, 15–16.iii.2009, WT, leg. C. Schmid-Egger. 1♂, Dubai, Mushrif Park, 23.ii.2006, HC, leg. J.C. Deeming.

Differential diagnosis: The genus *Amnonia* Kugler, 1971, differs from the related genus *Atylomyia* Brauer, 1898, by the rounded bend without appendix in vein r_m in the wing. Kugler (1971) is in error on the appendix, see Tschorsnig & Richter (1998). The hairs on the barette, lacking in *Atylomyia*, are very sparse and difficult to see. So far, the only species of the genus *Amnonia* is *carmelitana* Kugler, 1971. The new species *A. deemangi* differs from *A. carmelitana* by the lack of any greyish dusting on the thorax and abdomen. *A. carmelitana* has distinct bands of greyish dusting on tergites 3 and 4 and on the anterior part of the thorax (Kugler, 1971; confirmed by H.-P. Tschorsnig, pers. comm., who has seen the type). According to Kugler (1971) and Tschorsnig & Richter (1998), the eyes are hairy in *A. carmelitana*; in *A. deemangi* they are bare. I have not seen the type of *A. carmelitana*.

Description: Male (Plates 1–3). Length 3.5–4 mm. Colouration: Thorax and abdomen completely blackish, without dusting (Plate 1). Legs black. Face and parafrontalia silvery grey, only black at vertex. Antennae dark, tip of second and base of third segment brownish. Palpus light yellow. Wings hyaline, epaulette and basicosta black. Calyptre white, inner rim dark on basal half.

Head. Vertex 3/5–2/3 of width of an eye. Face in profile about as long as frons, mouth margin slightly projecting (Plate 2). Parafacialia downwards strongly tapering, at smallest point only half as broad as third antennal segment. Gena 1/5–1/4 of greater eye diameter. Eyes bare. Third antennal segment 3.5–4 times as long as broad, 2–2.5 times as long as second, at apex distinctly pointed (like in *Acemyia* Robineau-Desvoidy, 1830). Arista virtually bare (with very small setulae at high magnification), thickened on basal 1/3–2/5, second segment slightly longer than broad. Inner vertical seta strong, outer vertical seta absent, frontal bristles descending to middle of second antennal segment, upper 2–3 pairs reclinate, others crossed. Outside this row 1–2 rows of hairs. Ocellar bristles proclinate, distinct but less strong than frontal bristles. Parafacialia bare. Vibrissa at mouth margin, nearly as long as antenna. Occipital dilation on gena with 3–4 rows of black hairs and on the lower rim a row of 5–6 stronger bristles. Occiput completely black haired. Palpi slightly clavate at tip.

Thorax with ACR 3+3–4, DC 2–3+4, IA 1+3, prae-alar nearly as strong as smallest notopleural bristle, humeri with 3 bristles nearly in a straight line, STPL 2, prosternum with 2–3 pairs of setae, barette with 1–3 small hairs. Scutellum with strong basals and subapical marginal setae, latter converging, apicals much smaller, crossed and half erect, lateral absent. Disc of scutellum with 3 pairs of discal setulae nearly as strong as apical marginal.



Plate 1. *Amnonia deemangi* Zeegers nov. spec., male, dorsal view.

Abdomen with excavation in syntergite 1&2 reaching hind margin, syntergite 1&2 only with lateromarginal bristles, tergite 3 with a pair of marginals and lateromarginals, tergite 4 with 8 marginals, tergite 5 with a row of marginals and hairlike discals. Syntergite 1&2 densely set with erect hairs, tergites 3 and 4 densely set with adpressed hairs, only erect at lateral margin. In contrast, tergite 5 largely bare, with only 2–3 rows of erect long hairs before marginal setae.

Legs relatively short, coxa 1 with strong bristles, but bare on inner surface, tibia 1 with 2 preapicals (dorsal and antero-dorsal), claws and pulvilli shorter than fifth tarsal segment, tibia 2 with 1 strong antero-dorsal and 1 strong ventral (inner) bristle.

Wing (Plate 3) with topcel closed on margin or just open, bend of vein m rounded, much closer to wing margin than to crossvein m-cu, costal spine distinct, as long as crossvein r-m, base of vein r_{4+5} with 2 setulae, first section of costa covered with setulae from below. Calytra large, convexly swollen as typical for the tribe Ethillini Verbeke, 1962.

Male genitalia. Cerci in lateral view strongly bent, surstyli in dorsal view abruptly bend halfway, so that the tips of cerci and surstyli come together in one point (apparently the typical situation in Ethillini (Tschorsnig, 1985)).

Female. Very similar to male. Vertex a little broader, with 2 pairs of proclinate setae, the lower pair is standing rather low. Palpi more clavate. Outer vertical seta strong, half as long



Plates 2. *Amnonia deemangi* Zeegers nov. spec., male, head in lateral view.

as inner vertical seta. Frontal tarsi somewhat flattened and broadened, especially fourth segment.

Etymology: It is my pleasure to name this species to its first collector, John Deeming. Over the years John has contributed many interesting Tachinidae from Arabia to the author.

***Aplomyia metallica* (Wiedemann, 1824)**

Specimens examined: Sharjah Desert Park, 1♀, 6–30.iv.2005, LT.

Distribution: Widespread in Oriental & Afrotropical region (Crosskey, 1980), Israel (Herting, 1984), Yemen (Zeegers, 2007). New to the UAE.

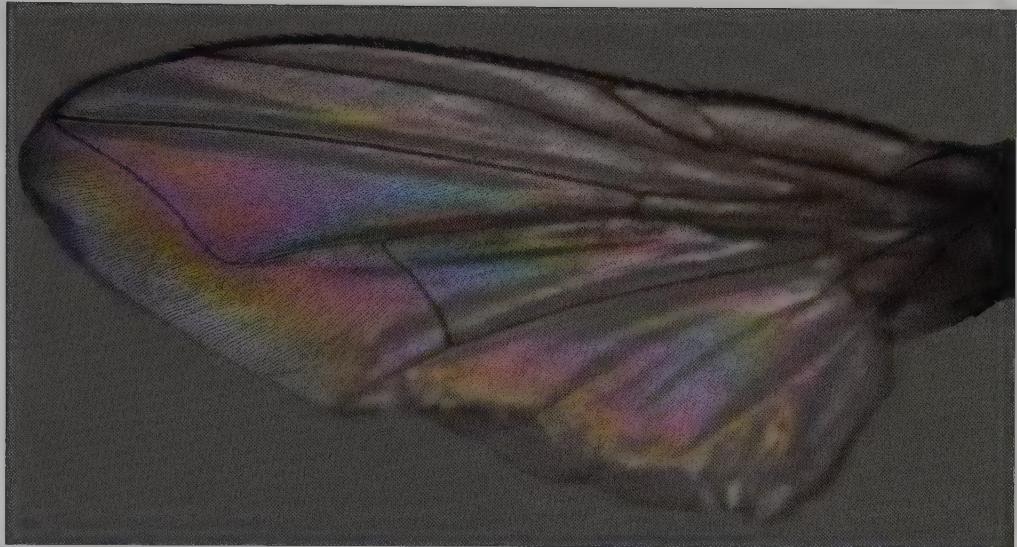


Plate 3. *Amnonia deemangi* Zeegers nov. spec., male, wing.

***Cestonia canariensis* Villeneuve, 1936**

Specimens examined: Sharjah Desert Park, 1♀, 20.xii.2004, WT.

Plate 4

Remarks: The specimen from the UAE has a few (2–3) smaller setulae present on vein r_1 (Plate 4). These setulae are less conspicuous than those on the base of vein r . This might explain why Herting (1981) did not mention these setulae.

Distribution: Canary Islands, Israel (Herting, 1981). New to the UAE.

***Cestonia cf. harteni* Zeegers, 2007**

Specimens examined: Wadi Wurayah, 1♀, 12–14.iv.2005, MT & WT, leg. T. Pape.

Remarks: *Cestonia harteni* is so far known only from the holotype from Yemen (Zeegers, 2007). In general, the specimen from the UAE resembles *harteni*, however, with the following differences: Parafacial narrow (broad in *harteni*), second antennal segment shorter, therefore third segment nearly twice as long as second (hardly longer than second in *harteni*), third antennal segment largely yellow, with anterior rim darkened (largely darkened in *harteni*), petiole of cell r_5 shorter, only 1/3 of apical crossvein (2/3 in *harteni*), outer vertical seta absent (small in *harteni*). The apical scutellar bristles are semi-erect (inclined 60 degrees) (unknown for *harteni*, but conjectured to be similar). The relevance of these differences cannot be assessed at the moment.

***Cestonionerva petiolata* Villeneuve, 1910**

Specimens examined: Near ad-Dhaid, 2♂, 16–19.iii.2007, WT, leg. J. Batelka.

Distribution: Eremic zone from North Africa to Mongolia (Herting, 1984). New to the UAE.

***Chaetogena acuminata* Rondani, 1859**

Specimens examined: Al-Ajban, 1♀, 17–24.iv.2006, MT. Bithnah, 4♂, 4.vii–12.viii.2006, LT. SSW of ad-Dhaid, 1♂, 24–30.v.2006, LT.

Distribution: Widespread in Afrotropical, Oriental and Palaearctic Region (Crosskey, 1976, 1980; Herting, 1984), Yemen (Zeegers, 2007). New to the UAE.



Plate 4. *Cestonia canariensis* Villeneuve, wing.

***Chaetogena cercosa* Kugler, 1980**

Specimens examined: Sharjah Desert Park, 1♂, 29.iii–6.iv.2005, LT.

Remarks: The specimen was identified by H.-P. Tschorsnig.

Distribution: Israel (Herting, 1984). New to the UAE.

***Chaetoria stylata* Becker, 1908**

Specimens examined: Abu Dhabi, 1♂, 6.ii.1987, leg. I.L. Hamer (ZMA). Bithnah, 1♂, 4.vii–12.viii.2006, LT; 2♂, 1♀, 12.viii–9.ix.2006, MT. Fujairah, 3♂, 2♀, 20–27.v.2006, LT. Hatta, 2♂, 3♀, 8–26.iv.2006, LT. Wadi Maidaq, 1♀, 27.vi–29.vii.2006, MT.

Remarks: All specimens have setulae present on basal half of vein r_1 . This is in agreement with Mesnil (1944–1975). However, in the holotype from the Canary Islands those setulae are lacking, as has been kindly confirmed by Dr. J. Ziegler, Berlin. In a recently discovered second specimen from the Canary Islands, vein r_1 is bare as well (coll. ThZ). Given the paucity of material available, we cannot reach a final conclusion on the relevance of this difference.'

Distribution: Africa, Mediterranean, Uzbekistan (Crosskey, 1980; Herting, 1984). New to the UAE.

***Drino atropivora* (Robineau-Desvoidy, 1830)**

Specimens examined: Sharjah Desert Park, 1♀, 4–8.xii.2004, WT.

Distribution: Widespread in Afrotropical and Palaearctic region (Crosskey, 1980). New to the UAE.

***Drino ciliata* (Van der Wulp, 1881)**

Specimens examined: Wadi Wurayah, 1♀, 12–14.iv.2005, MT, leg. T. Pape.

Distribution: Widespread in Afrotropical and Oriental region (Crosskey, 1980). New to the UAE.

***Drino latigena* (Mesnil, 1944)**

Specimens examined: Al-Ajban, 1♀, 9.xi–7.xii.2005, LT. Near ad-Dhaid, 1♀, 16–19.iii.2007, WT, leg. J. Batelka. Sharjah Desert Park, 2♂, 1♀, 4–8.xii.2004, WT; 1♀, 9–21.iii.2005, LT; 1♀, 21–29.iii.2005, LT; 2♂, 2♀, 6–28.xii.2006, PT; 2♂, 24.xi–22.xii.2007, LT. Wadi Maidaq, 1♂, 5.iii.2005, HC. Wadi Wurayah, 1♂, 1♀, 12–14.iv.2005, MT & WT, leg. T. Pape.

Remarks: This species is the same as *Drino imberbis* (Wiedemann, 1830) sensu Crosskey (1967). However, as the type material of *imberbis* Wiedemann seems to be lost, it is in my opinion better to avoid this name.

Distribution: Eremic zone in Africa and Middle East (Crosskey, 1980). New to the UAE.

***Drino zonata* (Curran, 1927)**

Specimens examined: Near ad-Dhaid, 6♂, 1♀, 16–19.iii.2007, WT, leg. J. Batelka. SE of ad-Dhaid, 1♀, 27.xi–1.xii.2005, WT. 7 km S of al-Jazirat al-Hamra, 1♀, 1.xii.2004, WT. Sharjah Desert Park, 1♂, 2♀, 4–8.xii.2004, WT; 5♂, 3♀, 29.iii–6.iv.2005, LT; 1♂, 1♀, 6–30.iv.2005, LT; 1♂, 1♀, 25.ii–25.iii.2006, LT. Wadi Maidaq, 1♂, 1♀, 26.xii.2005–2.i.2006, WT.

Remarks: This species is the same as *Drino imberbis* (Wiedemann, 1830) sensu Herting (1984). I follow Crosskey (1967) in preferring the name *zonata* (see also Zeegers, 2007).

Distribution: Africa, Mediterranean, Saudi Arabia (Crosskey, 1980), Yemen (Zeegers, 2007). New to the UAE.

***Exorista xanthaspis* (Wiedemann, 1830)**

Specimens examined: Near ad-Dhaid, 1♀, 16–19.iii.2007, WT, leg. J. Batelka. 7 km S of al-Jazirat al-Hamra, 1♀, 29.xii.2004, WT. Wadi Wurayah, 2♀, 12–14.iv.2005, MT & WT, leg. T. Pape.

Distribution: Widespread in Afrotropical and Oriental regions (Crosskey, 1980), southern part of Palaearctic Region (Herting, 1984), Yemen (Zeegers, 2007). New to the UAE.

***Goniophthalmus halli* Mesnil, 1956**

Specimens examined: Al-Ajban, 9♂, 9.xi–7.xii.2005, LT; 3♂, 7–28.xii.2005, LT.

Distribution: Widespread in Afrotropical region (Crosskey, 1980), Israel (Herting, 1984), Yemen (Zeegers, 2007). New to the UAE.

***Metacemyia aartseni* Zeegers, 2007**

Specimens examined: Al-Ajban, 1♀, 9.xi–7.xii.2005, LT & MT.

Distribution: This species has been described only very recently from Yemen (Zeegers, 2007). Also recorded from Israel (Bystrowski & Zeegers, 2008). New to the UAE.

***Metacemyia calloti* (Séguy, 1936)**

Specimens examined: Al-Ajban, 1♂, 7–28.xii.2005, MT & LT.

Distribution: Southern part of Palaearctic region (Herting, 1984), Africa (Crosskey, 1980), Yemen (Zeegers, 2007). New to the UAE.

***Prosopodopsis* spec.**

Specimens examined: Hatta, 1♂, 7.ix.1981, leg. I.L. Hamer (ZMA); 1♂, 1♀, 13.ii.1987, leg. I.L. Hamer (ZMA). Sharjah Desert Park, 1♂, 6–30.iv.2005, LT.

Remarks: The genus *Prosopodopsis* Townsend, 1926, is in need of a revision. This species has the cell r5 in the wing petiolated.

***Pseudogonia rufifrons* (Wiedemann, 1830)**

Specimens examined: Abu Dhabi, 1♀, 1.i.1986, leg. I.L. Hamer (ZMA); 2♂, 1♀, 31.iii.1987, leg. I.L. Hamer (ZMA).



Plate 5. *Thecocarcelia* cf. *latifrons* Mesnil, male, head in lateral view.

Distribution: Widespread in Palaearctic, Afrotropical and Oriental regions (Herting, 1984). New to the UAE.

***Rhynchogonia algerica* Brauer & Bergenstamm, 1893**

Specimens examined: N of Ajman, 1♂, 1♀, 11–25.xi.2006, WT; 1♂, 1–20.ix.2007, WT; 2♂, 21.ix–25.x.2007, WT.

Distribution: Algeria, Israel, Turkmenistan (Herting, 1984). New to the UAE.

***Thecocarcelia* cf. *latifrons* Mesnil, 1949**

Plate 5

Specimens examined: Wadi Wurayah, 2♂, 12–14.iv.2005, MT & WT, leg. T. Pape.

Remarks: This material (Plate 5) agrees with the description of *latifrons* by Mesnil, based on material from the Afrotropical region. I had no opportunity to study the type material, so the identification remains provisional.***Thelyconychia solivaga* (Rondani, 1861)**

Specimens examined: Abu Dhabi, 1♂, 31.iii.1987, leg. I.L. Hamer (ZMA). Hatta, 2♂, 8–26.iv.2006, LT. Sharjah Desert Park, 1♂, 6–30.iv.2005, LT; 1♀, 31.v–12.vi.2005, LT; 1♀, 12–28.vi.2005, LT.

Distribution: Southern part of Palaearctic region (Herting, 1984), Yemen (Zeegers, 2007). New to the UAE.

cf. ***Cadurciella* spec.**

Specimens examined: Wadi Wurayah, 1♀, 12–14.iv.2005, MT & WT, leg. T. Pape.

Remarks: This species remains unrecognizable and its placement in the genus *Cadurciella* Villeneuve, 1927, is tentative.

Genus and species unidentified

Specimens examined: Wadi Wurayah, 1♂, 12–14.iv.2005, MT & WT, leg. T. Pape.

Remarks: The specimen resembles some species of *Prosopodopsis*, like the one recorded from Yemen (Zeegers, 2007). However, syntergite 1&2 has a pair of marginal setae and the wing venation is not consistent, since crossvein m-cu meets vein m closer to its bend than to r-m. The head looks in profile similar to *Erythrocera* Robineau-Desvoidy, 1848. The facial ridge has, however, strong setae on lower 4/5, which makes it difficult to include the specimen in either *Erythrocera* or *Lydellina* Villeneuve, 1916.Subfamily **Phasiinae** Robineau-Desvoidy, 1830***Dionomelia hennigi* Kugler, 1978**

Specimens examined: NARC, near Sweihan, 1♂, 2–30.iv.2005, LT.

Remarks: Identification confirmed by H.-P. Tschorsnig.

Distribution: So far only known from Israel (Kugler, 1978) and Spain (Tschorsnig et al., 1997). New to the UAE.

***Cylindromyia rufipes* (Meigen, 1824)**

Specimens examined: Fujairah, 1♂, 20–27.v.2006, LT.

Remarks: The problems of identification in the *rufipes*-group have been treated by Zeegers (2007).

Distribution: Mediterranean region, Pakistan (Herting, 1984). New to the UAE.

***Euthera tuckeri* (Loew, 1856)**

Specimens examined: Fujairah, 1♂, 18–19.iv.2006, LT, leg. M. Fibiger; 1♀, 20–27.v.2006, LT. Wadi Maidaq, 1♂, 29.vii–26.viii.2006, MT.

Distribution: Widespread in the Afrotropical region, Pakistan (Crosskey, 1980). New to the UAE.

***Leucostoma engeddense* Kugler, 1967**

Specimens examined: Bithnah, 1♀, 4.vii–12.viii.2006, LT; 2♀, 12.viii–9.ix.2006, MT. Fujairah, 1♂, 1.xii.2004, LT. Hatta, 1♀, 24–25.xii.1985, leg. I.L. Hamer (ZMA). Wadi Wurayah, 1♂, 16♀, 12–14.iv.2005, MT & WT. leg. T. Pape.



Plate 6. *Linnaemyia latigena* Kugler, habitus. (Photograph by Martin Hauser)

Distribution: Mediterranean region (Herting, 1984). New to the UAE.

Subfamily **Tachininae** Robineau-Desvoidy, 1830

***Clausicella xanthomera* (Richter, 1972)**

Specimens examined: Tayyibah, 1♂, 13–14.iv.2005, HC, leg. K. Szpila; 1♂, 20.iv.2005, HC, leg. K. Szpila. Wadi Wurayah, 1♂, 12–14.iv.2005, MT & WT, leg. T. Pape;

Remarks: This species strongly resembles a Miltogramminae (Sarcophagidae) in colouration.

Distribution: Mongolia, Turkmenistan, Uzbekistan (Herting, 1984). New to the UAE.

***Linnaemyia latigena* Kugler, 1977**

Plates 6–7

Specimens examined: N of Ajman, dunes with mangrove, 1♀, 11.iii.2008, leg. M. Hauser, det. H.-P. Tschorasnig; 1♂, 6♀, 15–16.iii.2009, WT, leg. C. Schmid-Egger. Sharjah Desert Park, 1♀, 1♂, 24.xi–22.xii.2007, LT; 2♂, 12.iii.2008, HC, leg. M. Hauser, det H.-P. Tschorasnig. Wadi Maidaq, 1♀, 26.xii.2005–2.i.2006, WT.

Remarks: This species resembles *L. soror* (Fallén, 1810), and especially *L. comta* (Fallén, 1810) (Plate 6), from which it is separated by the broader vertex and parafacialia (Plate 7) and the lack of discal setae on tergites (Kugler, 1977). The arista is thickened nearly to apex. It fits in the *pallida*-complex of the subgenus *Linnaemyia* Robineau-Desvoidy, 1830 s.s. as defined by Herting (1983), but it was (erroneously?) not treated as such by Herting (1983). It keys out to *pallida* in Herting's (l.c.) key. However, it is easily separated by the light hairs on ventral side of tergites being restricted to syntergite 1&2. The colouration of hairs was not



Plate 7. *Linnaemyia latigena* Kugler, head in lateral view.

mentioned by Kugler (1977), but was kindly established by H.-P. Tschorsnig (pers. comm.) based on a paratype and additional material present in SMNS. In *pallida*, according to Herting (l.c.), white hairs are extensively present on tergite 3 and even on the anterior part of tergite 4.

Distribution: Egypt, Israel (Kugler, 1977). New to the UAE.

***Macquartia* cf. *nitidicollis* van Emden, 1960**

Specimens examined: Wadi Maidaq, 1♀, 5.iii.2005, HC. Wadi Safad, 1♂, 15–22.iv.2006, LT. Wadi Wurayah, 11♂, 1♀, 12–14.iv.2005, MT & WT, leg. T. Pape.

Plate 8



Plate 8. *Macquartia* cf. *nitidicollis* van Emden, head in lateral view.

Remarks: The specimens agree with the description of *nitidicollis* by Van Emden (1960), based on material from Kenya (Plate 8). I had no opportunity to study the type material, so the identification remains provisional.

***Peleteria ruficornis* (Macquart, 1835)**

Specimens examined: Wadi Wurayah, 1♂, 12–14.iv.2005, MT; 1♀, 10–26.xii.2006, WT.

Distribution: Afrotropical region (Crosskey, 1980), southern part of Palaearctic region (Herting, 1984), Yemen (Zeegers, 2007). New to the UAE.

***Peribaea orbata* (Wiedemann, 1830)**

Specimens examined: Al-Ajban, 1♂, 2♀, 26.iii–4.iv.2006, MT. Hatta, 2♂, 1♀, 8–26.iv.2006, LT.

Distribution: Widespread in Afrotropical and Oriental region, Middle East (Crosskey, 1980), Yemen (Zeegers, 2007). New to the UAE.

***Peribaea palaestina* (Villeneuve, 1934)**

Specimens examined: Al-Ajban, 1♂, 9.xi–7.xii.2005, MT; 3♂, 1♀, 7–28.xii.2005, MT; 1♂, 2♀, 26.iii–4.iv.2006, MT; 1♀, 1–8.iv.2006, MT; 3♂, 3♀, 17–24.iv.2006, MT. Bithnah, 1♂, 31.xii.2005–2.ii.2006, LT; 3♂, 4.vii–12.viii.2006, LT. Fujairah, 1♂, 13.v–5.vi.2005, LT; 1♀, 13–29.xi.2005, LT. Hatta, 1♂, 7.ix.1981, leg. I.L. Hamer. Al-Jazirat al-Hamra, 1♂, 29.xii.2004, WT. Sharjah, 1♂, 1♀, 12–28.vi.2005, LT. Sharjah Desert Park, 5♀, 29.iii–6.iv.2005, LT; 1♀, 6–30.iv.2005, LT. Wadi Wurayah, 1♂, 4♀, 12–14.iv.2005, MT & WT, leg. T. Pape. Tayyibah, 1♂, 1♀, 13–14.iv.2005, leg. K. Szpila; 1♂, 20.iv.2005, leg. K. Szpila.

Distribution: Eremic parts of the Palaearctic region (Herting, 1984), Yemen (Zeegers, 2007). New to the UAE.

***Peribaea palaestina* (Villeneuve, 1934) melanistic form**

Specimens examined: Bithnah, 1♂, 4.vii–12.viii.2006, MT; 1♂, 12.viii–9.ix.2006, MT.

Remarks: This aberrant colour form is completely dark, lacking the normally characteristic orange sidemarkings on abdomen. It can still be recognized by its morphological characters, such as the setulae on vein r_1 (Zeegers, 2007).

***Phytomyptera lacteipennis* Villeneuve, 1934**

Specimens examined: Al-Ajban, 1♂, 2♀, 23–30.xi.2005, MT; 1♀, 7–28.xii.2005, MT.

Distribution: Eremic parts of Palaearctic region (Herting, 1984). New to the UAE.

***Rossimyiops subaperta* (Herting, 1983)**

Specimens examined: Bithnah, 2♀, 4.vii–12.viii.2006, LT.

Remarks: This species was traditionally placed in the genus *Mesnilomyia* Kugler, 1972. However, Cerretti et al. (2009) recently synonymized this genus with the Afrotropical *Rossimyiops* Mesnil, 1953. Moreover, they described the female of *subaperta* for the first time.

Distribution: Iran (Herting, 1984), Uzbekistan (Ziegler, 1991), Israel (Cerretti et al., 2009). New to the UAE.

ACKNOWLEDGEMENTS

Most specimens have become available through the work of A. van Harten. I would like to thank him for his constant sharing of interesting material. John Deeming selected the Tachinidae from samples and additionally collected some Tachinidae himself, including the new *A. deemingi*. Also Cezary Bystrowski and Ben Brugge made some material available. The late Bob van Aartsen prepared most of the material from alcohol. Hans-Peter Tschorasnig kindly helped with some of the more difficult identifications, including the check on the paratype of *Linnaemyia latigena*. Martin Hauser provided the field photo of *Linnaemyia latigena*.

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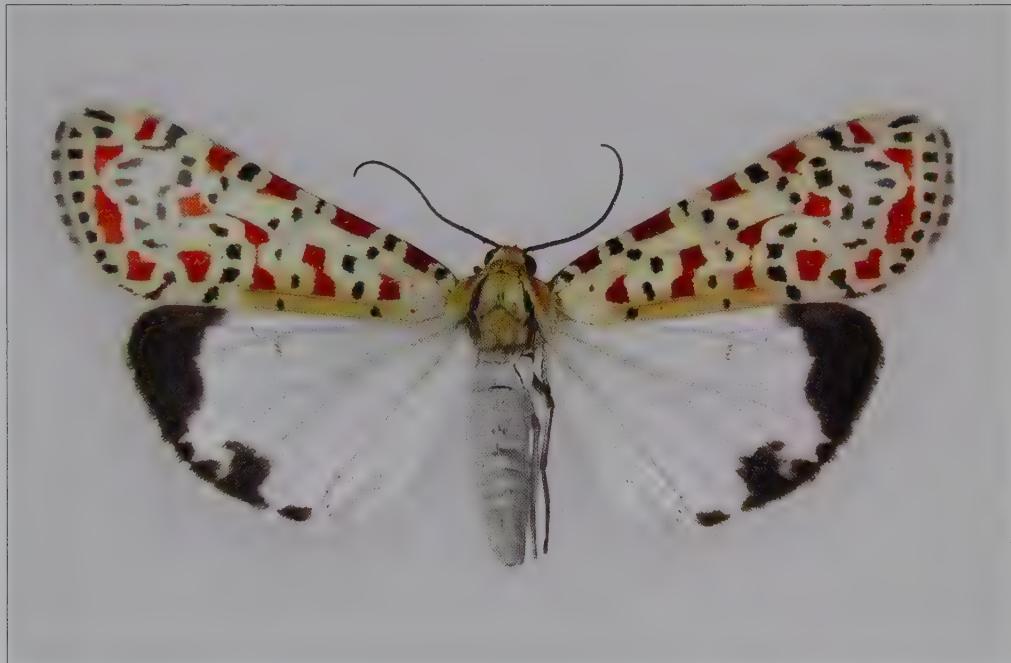
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Erratum

M. Fibiger & A. Legrain (2009) Order Lepidoptera, superfamily Noctuoidea. *Arthropod fauna of the UAE*, 2: 480-660.

The photographs of *Utetheisa pulchella* (Plate 111) and *Utetheisa lotrix lepida* (Plate 112) were wrong. Plate 111 illustrates *Utetheisa lotrix lepida*, whereas the moth in Plate 112 is *Utetheisa amhara*. The correct photograph of *Utetheisa pulchella* is:



Coordinates of localities in the UAE

Abu Dhabi	24°29'N 54°21'E	Margham	24°55'N 55°38'E
Abu Saluf (Dubai)	25°13'N 55°19'E	Masafi	25°18'N 56°10'E
Ajman (N of)	25°26'N 55°29'E	al-Muwaiji (al-Ain)	24°12'N 55°42'E
al-Ain	24°13'N 55°46'E	Nakhalai (Dubai)	25°06'N 55°34'E
al-Ain al-Fayda	24°05'N 55°41'E	Qurraya	25°14'N 56°21'E
al-Ajban	24°36'N 55°01'E	ar-Rafah	25°43'N 55°51'E
al-Awir (Dubai)	25°10'N 55°33'E	Ra's Ghanada	24°49'N 54°44'E
Bithnah	25°11'N 56°14'E	Ra's al-Khaimah	25°48'N 55°57'E
ad-Dhahirah (Jazeerah)	25°21'N 55°23'E	Ra's al-Khaimah (S of)	25°44'N 55°52'E
ad-Dhaid	25°17'N 55°53'E	Ra's al-Khaimah (Ghof forest)	25°38'N 55°54'E
Dibba	25°36'N 56°15'E	Rasheed (near ad-Dhaid)	25°17'N 55°53'E
Digdaga	25°38'E 55°54'E	Ruwais	24°05'N 52°38'E
Dubai	25°10'N 55°19'E	al-Samha (NE of Abu Dhabi)	24°40'N 54°45'E
Dubai (Mushrif Park)	25°17'N 55°28'E	Sharjah	25°21'N 55°24'E
Fagsha	25°10'N 56°11'E	Sharjah Desert Park	25°17'N 55°42'E
Fujairah	25°08'N 56°21'E	Sweihan	24°28'N 55°19'E
al-Ghail	25°24'N 56°04'E	Sweihan (NARC, near)	24°24'N 55°26'E
Ghalilah	26°01'N 56°05'E	Tawi al-Faqqa	24°38'N 55°31'E
Hatta	24°49'N 56°07'E	Tawi as-Saman	25°14'N 55°49'E
al-Hayer .	24°35'N 55°44'E	Um al-Quwain	25°32'N 55°32'E
Huwaylat	24°52'N 56°11'E	Um Urage al-Saadi (Adhan)	25°27'N 56°00'E
al-Jareef (5 km S of Tawyain)	25°32'N 56°04'E	Wadi Bih (dam)	25°48'N 56°04'E
al-Jazirat al Hamra	25°42'N 55°48'E	Wadi al-Ejili	25°00'N 56°07'E
Jebel Ali	24°59'N 55°01'E	Wadi Fara (near al-Ghail)	25°26'N 55°05'E
Jebel Dhanna	24°10'N 52°35'E	Wadi Hayl	25°05'N 56°13'E
Jebel Hafit	24°04'N 55°46'E	Wadi Maidaq	25°19'N 56°08'E
Jebel Jibir	25°39'N 56°07'E	Wadi Mirba	25°16'N 56°17'E
Jebel Mileiha	25°06'N 55°49'E	Wadi Safad	25°13'N 56°19'E
Khor al-Khwair	25°58'N 56°03'E	Wadi Shawkah	25°06'N 56°01'E
Khor Fakkan (dam)	25°21'N 56°19'E	Wadi Siji	25°10'N 56°01'E
Khor Kalba (mangrove)	25°00'N 56°22'E	Wadi Tarabat (Jebel Hafit)	24°08'N 55°45'E
Khor Kalba (tunnel)	24°59'N 56°14'E	Wadi Wurayah	25°24'N 56°17'E
Khor Yfrah	25°31'N 55°35'E	Wadi Wurayah (farm)	25°23'N 56°19'E
Mahafiz	25°12'N 55°44'E	al-Wathba	24°16'N 56°36'E
Marbad	25°20'N 56°09'E		

N.B. The coordinates listed for Wadi Shawkah in Volumes 1 and 2 were wrong.

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Notes: _____







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